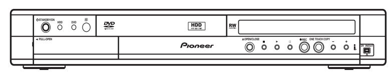
Pioneer sound.vision.soul

Service Manual



DVR-520H-S

ORDER NO.
RRV2963

DVD RECORDER

DVR-520H-S
DVR-65H-S

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Model	Type	Power Requirement	Region No.	**Serial No.** Please confirm 3rd & 4th alphabetical letters.
DVR-520H-S	KU/CA	AC120V	1	
DVR-520H-S	KUXU/CA	AC120V	1	&&PG######$$
DVR-65H-S	KCXU	AC120V	1	&&PG######$$

- **When servicing this model, some service procedures may reset the settings that customer set (*) to the factory default settings. Make sure to explain this to the customer.**

(*) : Initial Setup (Clock Setting, Remote Control Set, Channel settings, Video Out settings, Audio In settings, Audio Out settings, Language settings)

Refer to the chapter 13 of the Operating Instructions for more details.

An HDD (Hard Disc Drive) is mounted in this product.
The HDD is a precision instrument very vulnerable to shock and electrostatic charges.
Please read "7.4 Cautions on Handling the HDD" in this manual and exercise sufficient caution when handling the HDD itself, as well as the product with the HDD built in.
When an HDD becomes defective and inoperable, restoration of the user's data recorded on the HDD, or copying of the user's recorded data to other media (such as a new HDD) is totally impossible. Before servicing, OBTAIN THE USER'S PRIOR CONSENT to that effect.
The user must be made aware that all recorded data are deleted if the HDD is intialized.



For details, refer to "Important symbols for good services" .

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936

T-ZZV MAY 2004 printed in Japan

SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

Health & Safety Code Section 25249.6 – Proposition 65

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

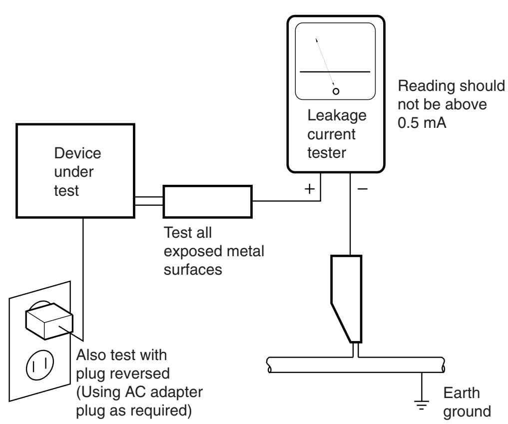
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60 Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5 mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

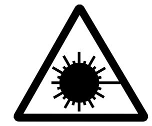
Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER : 70 mw
WAVELENGTH : 658 nm

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

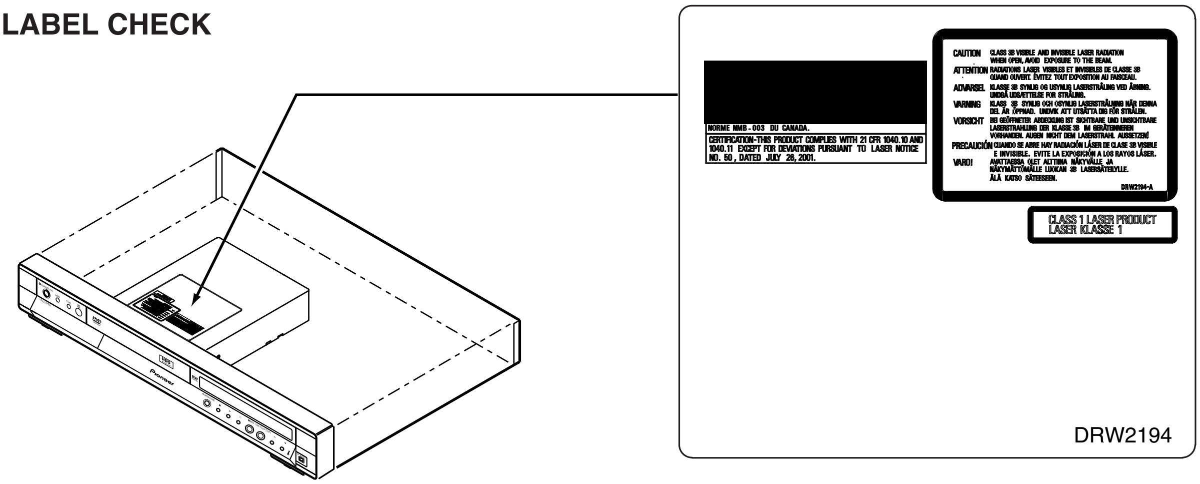


LASER
Picture 1
Warning sign for laser radiation

A

■ LABEL CHECK

B



C

Additional Laser Caution

1. The ON/OFF(ON:low level,OFF:high level) status of the CLAMP signals for detecting the loading state are detected by the drive CPUs, and the design prevents laser diode oscillation when the CLAMP signal turns OFF.
   In normal operation, if no disc is clamped, the laser diode oscillation is disabled.
   However, the interlock does not always operate in the test mode.

2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 3A laser beam.

D

E

F

[Important symbols for good services]

In this manual, the symbols shown-below indicate that adjustments, settings or cleaning should be made securely.
When you find the procedures bearing any of the symbols, be sure to fulfill them:

1. Product safety



You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.

2. Adjustments



To keep the original performances of the product, optimum adjustments or specification confirmation is indispensable. In accordance with the procedures or instructions described in this manual, adjustments should be performed.

3. Cleaning



For optical pickups, tape-deck heads, lenses and mirrors used in projection monitors, and other parts requiring cleaning, proper cleaning should be performed to restore their performances.

4. Shipping mode and shipping screws



To protect the product from damages or failures that may be caused during transit, the shipping mode should be set or the shipping screws should be installed before shipping out in accordance with this manual, if necessary.

5. Lubricants, glues, and replacement parts



Appropriately applying grease or glue can maintain the product performances. But improper lubrication or applying glue may lead to failures or troubles in the product. By following the instructions in this manual, be sure to apply the prescribed grease or glue to proper portions by the appropriate amount.For replacement parts or tools, the prescribed ones should be used.

CONTENTS

A B C D E F

1. SPECIFICATIONS

General

System	HDD, DVD-Video, DVD-R/RW, Video-CD, CD, CD-R/RW (WMA, MP3, JPEG, CD-DA)
Power requirements	120 V, 60 Hz
Power consumption	
DVR-65H	50 W
DVR-520H	48 W
Power consumption in standby mode	0.48 W (Front panel display: off)
Weight	10 lb. 2 oz. / 4.6 kg
Dimensions	420 (W) x 59 (H) x 339 (D) mm
Operating temperature	+5∞C to +35∞C
Operating humidity	5% to 85% (no condensation)
TV format	NTSC

Recording

Recording format	DVD Video Recording DVD-VIDEO

Recordable discs

DVD-RW (DVD Re-recordable disc)
DVD-R (DVD Recordable disc)

Video recording format

Sampling frequency	13.5MHz
Compression format	MPEG

Audio recording format

Sampling frequency	48kHz
Compression format	Dolby Digital or Linear PCM (uncompressed)

Recording time

HDD

Fine (FINE)	Approx. 17 hours
Standard Play (SP)	Approx. 34 hours
Long Play (LP)	Approx. 68 hours
Extended Play (EP)	Approx. 102 hours
Manual Mode (MN)	Approx. 17-102 hours

DVD-R/DVD-RW

Fine (FINE)	Approx. 1 hour
Standard Play (SP)	Approx. 2 hours
Long Play (LP)	Approx. 4 hours
Extended Play (EP)	Approx. 6 hours
Manual Mode (MN)	Approx. 1-6 hours

Tuner

Receivable channels

VHF	2-13ch
UHF	14-69ch
CATV	C1-C125ch

Timer

Programs	1 month/32 programs
Clock	Quartz lock (12-hour digital display)
Power off memory	Approx. 5 years (after manufacture)

Input/Output

VHF/UHF antenna input/output terminal	VHF/UHF set 75 Ω (F-shape connector)
Video input	Input 1 (rear), 3 (rear), 2 (front)
Input level	1 Vp-p (75Ω)
Jacks	RCA jack
Video output	Output 1,2
Output level	1 Vp-p (75Ω)
Jacks	RCA jack
S-Video input	Input 1, 3 (rear), 2 (front)
Y (luminance) - Input level	1 Vp-p (75 Ω)
C (color) - Input level	286 mVp-p (75Ω)
Jacks	4 pin mini DIN
S-Video output	Output 1,2
Y (luminance) - Output level	1 Vp-p (75 Ω)
C (color) - Output level	286 mVp-p (75Ω)
Jacks	4 pin mini DIN
Component video output	
Output level	Y: 1.0 Vp-p (75Ω) PB, PR: 0.7 Vp-p (75Ω)
Jacks	RCA jacks
Audio input	Input 1, 3 (rear), 2 (front) L/R
Input level	
During audio input	2V rms (Input impedance: more than 22 k Ω)
Jacks	RCA jacks
Audio output	Output 1,2 L/R
During audio output	2V rms (Output impedance: less than 1.5 k Ω)
Jacks	RCA jacks
Control input	Mini jack
DV input/output *(DVR-520H only)*	4 pin (i.LINK/IEEE 1394 standard)

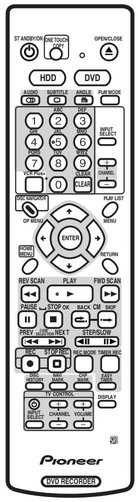
Supplied accessories

Remote control	1
Dry cell batteries (AA/R6P)	2
Audio / Video cable (red/white/yellow)	1
RF antenna cable	1
Power cable	1
Operating Instructions	1
Warranty card	1

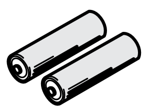
Note: The specifications and design of this product are subject to change without notice, due to improvement.

● Accessories

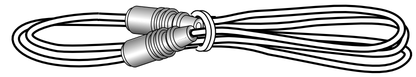
• Remote control ×1
(VXX2932)



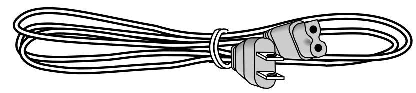
• Dry cell batteries ×2
(AA/R6P)



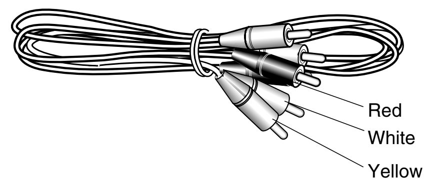
• RF antenna cable ×1
(VDE1025)



• Power cable ×1
(ADG7021 : DVR-520H-S/KU/CA)
(ADG7075 : DVR-520H-S/KUXU/CA
DVR-65H-S/KCXU)



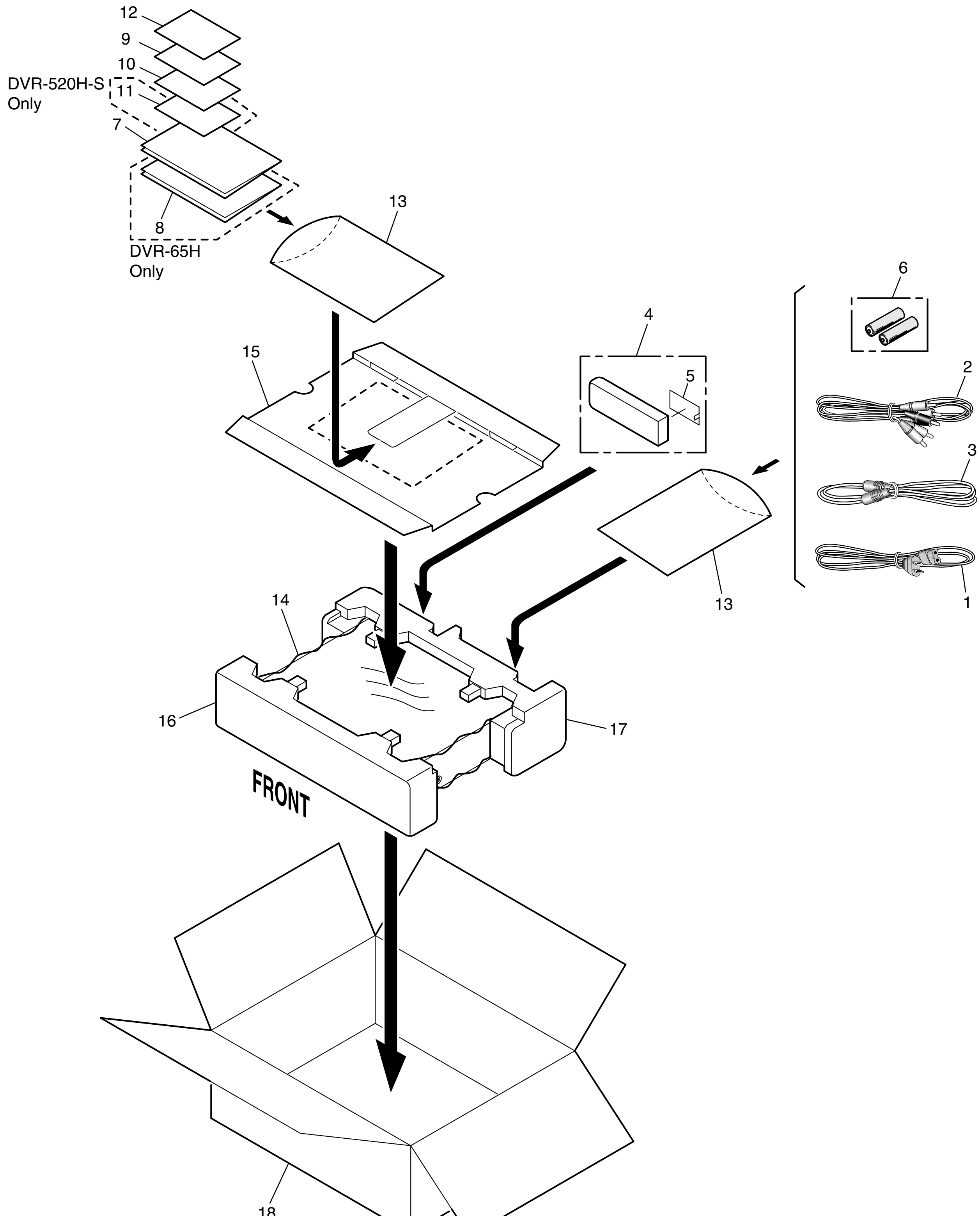
• Audio / Video cable(L=1.5m) ×1
(red/white/yellow)
(XDE3049 : DVR-520H-S/KU/CA)
(VDE1077 : DVR-520H-S/KUXU/CA
DVR-65H-S/KCXU)



2. EXPLODED VIEWS AND PARTS LIST

NOTES: ● *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
● *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
● *Screws adjacent to ▼ mark on product are used for disassembly.*
● *For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions, apply as you think it appropriate.)*

2.1 PACKING



PACKING parts List

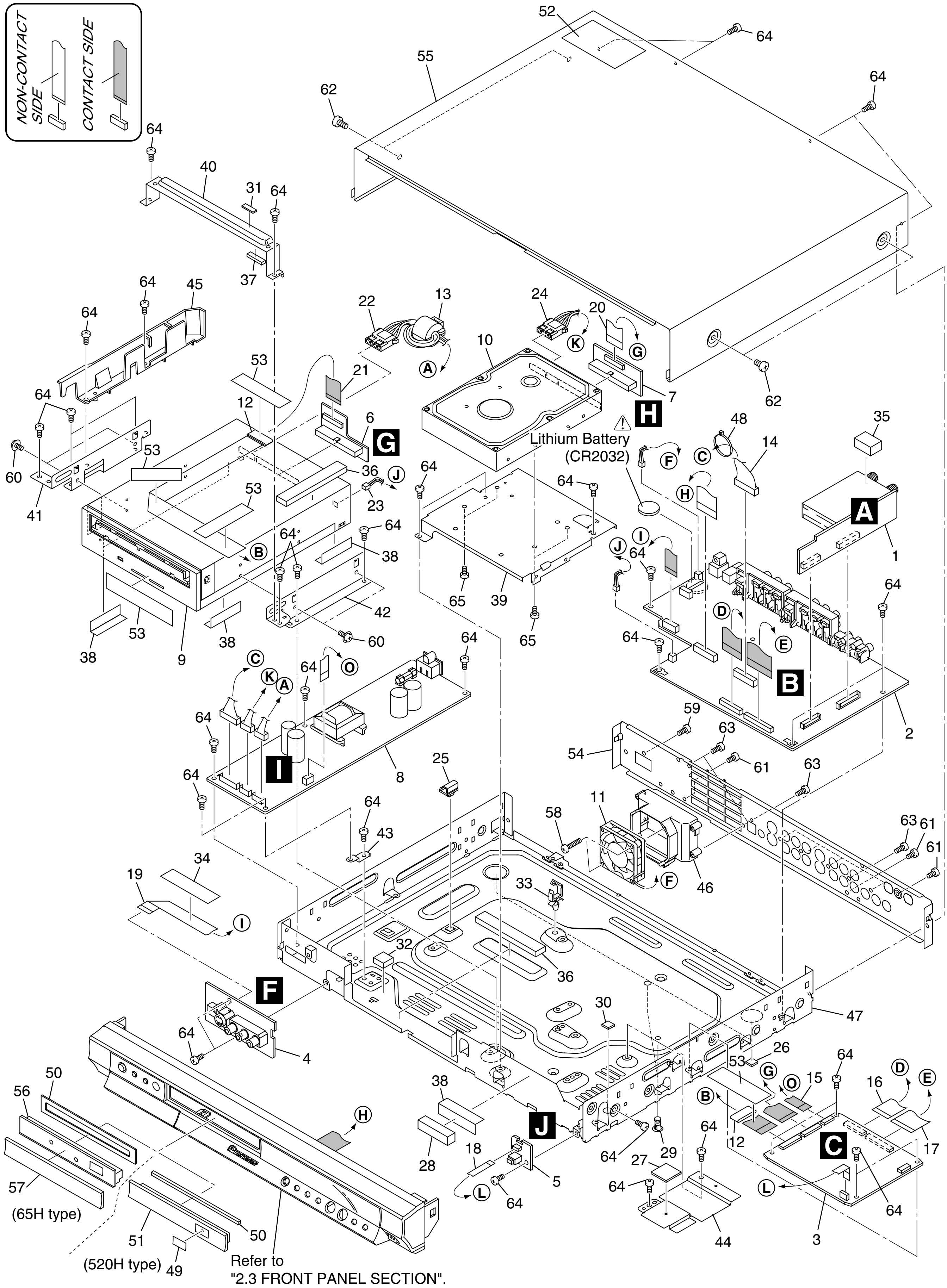
Mark	No.	Description	Part No.
⚠	1	Power Cable	See Contrast table (2)
	2	Audio / Video Cable	See Contrast table (2)
	3	RF Antenna Cable	VDE1025
	4	Remote Control	VXX2932
	5	Battery Cover	AZN7933
NSP	6	Dry Cell Battery (R6P, AA)	See Contrast table (2)
	7	Operating Instructions (English)	See Contrast table (2)
	8	Operating Instructions (French)	See Contrast table (2)
NSP	9	HDD Caution 8L B	VRR1046
NSP	10	HDD Caution 8L	VRR1047
NSP	11	Card	See Contrast table (2)
NSP	12	Warranty Card	See Contrast table (2)
	13	Polyethylene Bag	VHL1051
	14	Mirror Sheet	VHL1006
	15	IM Holder	See Contrast table (2)
	16	Front Pad	See Contrast table (2)
	17	Rear Pad	See Contrast table (2)
	18	Packing Case	See Contrast table (2)

(2) CONTRAST TABLE

DVR-520H-S/KU/CA, KUXU/CA and DVR-65H/KCXU are constructed the same except for the following :

Mark	No.	Symbol and Description	DVR-520H-S /KU/CA	DVR-520H-S /KUXU/CA	DVR-65H-S /KCXU
⚠	1	Power Cable	ADG7021	ADG7075	ADG7075
	2	Audio / Video Cable	XDE3049	VDE1077	VDE1077
NSP	6	Dry Cell Battery (R6P, AA)	VEM1031	VEM1030	VEM1030
	7	Operating Instructions (English)	VRB1338	VRB1338	VRB1343
	8	Operating Instructions (French)	Not used	Not used	VRC1210
NSP	11	Card	VRY1132	VRY1132	Not used
NSP	12	Warranty Card	ARY7045	ARY7045	ARY7007
	15	IM Holder	VHC1116	VHC1115	VHC1115
	16	Front Pad	VHA1368	VHA1364	VHA1364
	17	Rear Pad	VHA1369	VHA1365	VHA1365
	18	Packing Case	VHG2545	VHG2530	VHG2549

2.2 EXTERIOR


NON-CONTACT SIDE
CONTACT SIDE
Lithium Battery
(CR2032)
(65H type)
(520H type)
Refer to
"2.3 FRONT PANEL SECTION".

EXTERIOR parts List

Mark	No.	Description	Part No.
	1	TUNB Assy	VWV2010
	2	JCKB Assy	VWV2023
	3	MAIN Assy	VWV2025
	4	FRJB Assy	VWV2004
	5	DVJB Assy	VWV2006
	6	ATWB Assy	VWV2009
	7	ATHB Assy	VWV2011
⚠	8	POWER SUPPLY Unit	VWR1380
	9	DRIVE Assy R7 (for Service)	VXX2942
	10	HDD	See Contrast table (2)
	11	DC Fan Motor	VXM1114
	12	Ferrite Core	ATX1048
	13	Ferrite Core	See Contrast table (2)
	14	Connector Assy (13P)	PF13PP-D47
	15	Flexible Cable (8P)	See Contrast table (2)
	16	Flexible Cable (24P)	See Contrast table (2)
	17	Flexible Cable (32P)	See Contrast table (2)
	18	Flexible Cable (7P)	See Contrast table (2)
	19	Flexible Cable (13P)	See Contrast table (2)
	20	Flexible Cable (40P)	See Contrast table (2)
	21	Shield Flexible Cable (40P)	See Contrast table (2)
	22	Housing Assy (4P)	See Contrast table (2)
	23	Housing Assy (2P)	See Contrast table (2)
	24	Housing Assy (4P)	See Contrast table (2)
NSP	25	P. Plate Holder	PNY-405
	26	Rubber Foot	VEB1349
	27	Radiation Sheet	VEB1360
	28	Rubber Spacer	VEB1370
NSP	29	PC Support	VEC1749
	30	Heatsink Cushion	VEC2363
	31	Gasket Sheet	VEC2394
	32	Spacer	VEC2413
NSP	33	Clamp	VEC2418

Mark	No.	Description	Part No.
	34	FFC Protector	VEC2436
	35	Gasket 20 x 8T	VEC2437
	36	Gasket 75 x 7T	VEC2439
	37	Gasket Sheet 2	VEC2440
	38	Aluminum Tape	VEF1056
NSP	39	HDD Stay	VNE2334
NSP	40	Bonnet Angle	VNE2335
NSP	41	Writer Stay L	VNE2336
NSP	42	Writer Stay R	VNE2337
NSP	43	PCB Base	VNE2339
NSP	44	Heatsink	VNH1070
	45	SYPS Cover	VNK5426
	46	Fan Duct	VNK5427
NSP	47	Base Chassis Assy	VXA2682
NSP	48	Binder (BK-1)	ZCA-BK1
	49	HDD Badge	See Contrast table (2)
	50	Tray Sheet	See Contrast table (2)
	51	Tray Panel	See Contrast table (2)
	52	Bonnet Label	VRW2104
NSP	53	Tape	ZTA-156A-19
	54	Rear Panel	See Contrast table (2)
	55	Bonnet Case S	VXX2925
	56	Tray Panel Base	See Contrast table (2)
	57	Tray Panel Lens	See Contrast table (2)
	58	Screw	BPZ30P250FTC
	59	Screw	PBZ30P080FTC
	60	Screw	AMZ30P060FTC
	61	Screw	BBZ30P040FTC
	62	Screw	BCZ40P060FNI
	63	Screw	BPZ30P080FTC
	64	Screw	BBZ30P060FTC
	65	#6-32 Screw	DBA1125

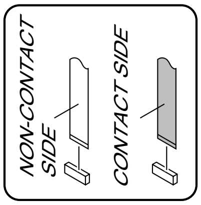
(2) CONTRAST TABLE

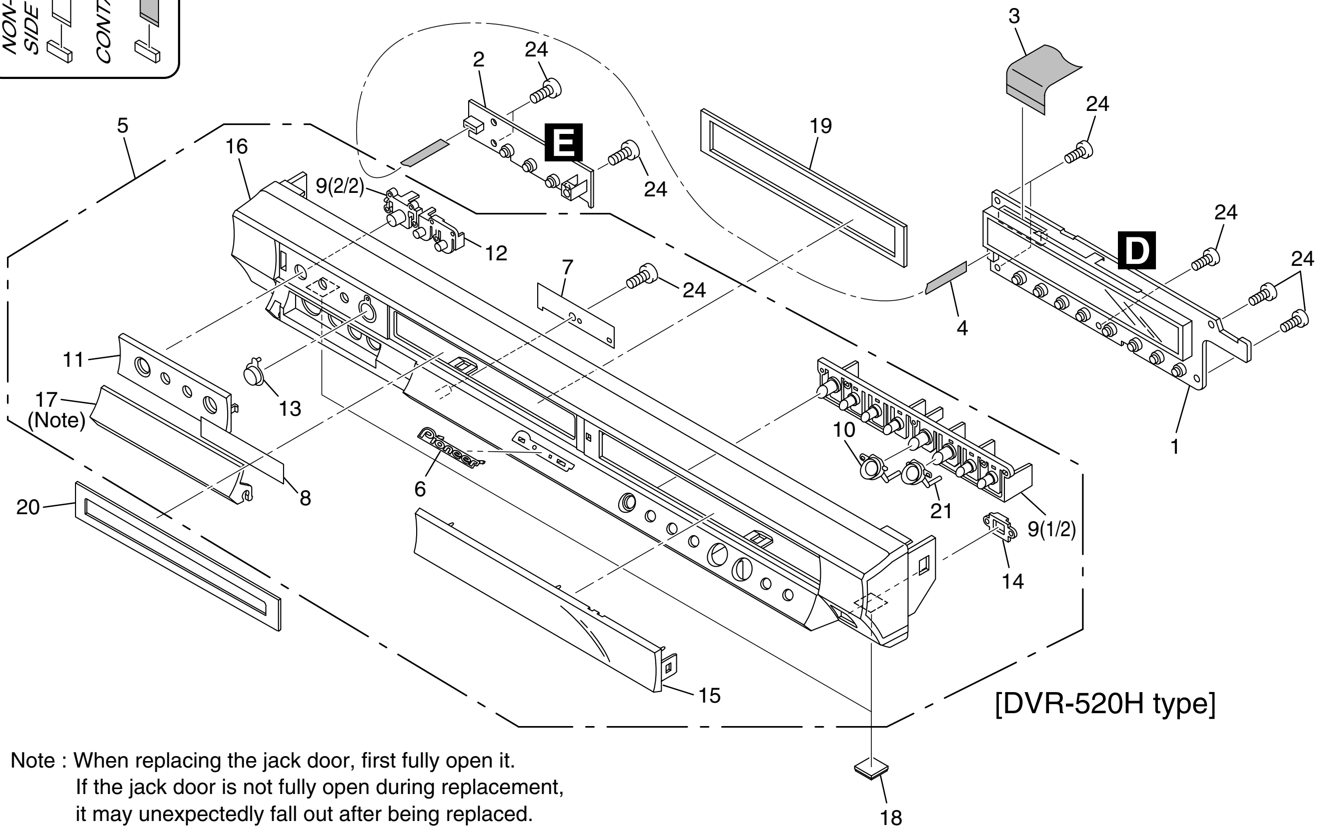
DVR-520H-S/KU/CA, KUXU/CA and DVR-65H/KCXU are constructed the same except for the following :

Mark	No.	Symbol and Description	DVR-520H-S /KU/CA	DVR-520H-S /KUXU/CA	DVR-65H-S /KCXU
	10	HDD 80G 4R080L0 SV	VXF1010	VXF1010	Not used
	10	HDD 160G 4R160L0 SV	Not used	Not used	VXF1028
	13	Ferrite Core	VTH1051	VTH1050	VTH1050
	15	Flexible Cable (8P)	VDA2011	VDA1997	VDA1997
	16	Flexible Cable (24P)	VDA2012	VDA1998	VDA1998
	17	Flexible Cable (32P)	VDA2013	VDA1999	VDA1999
	18	Flexible Cable (7P)	VDA2014	VDA2000	VDA2000
	19	Flexible Cable (13P)	VDA2015	VDA2001	VDA2001
	20	Flexible Cable (40P)	VDA2034	VDA2032	VDA2032
	21	Shield Flexible Cable (40P)	VDA2033	VDA2031	VDA2031
	22	Housing Assy (4P)	VKP2330	VKP2327	VKP2327
	23	Housing Assy (2P)	VKP2332	VKP2315	VKP2315

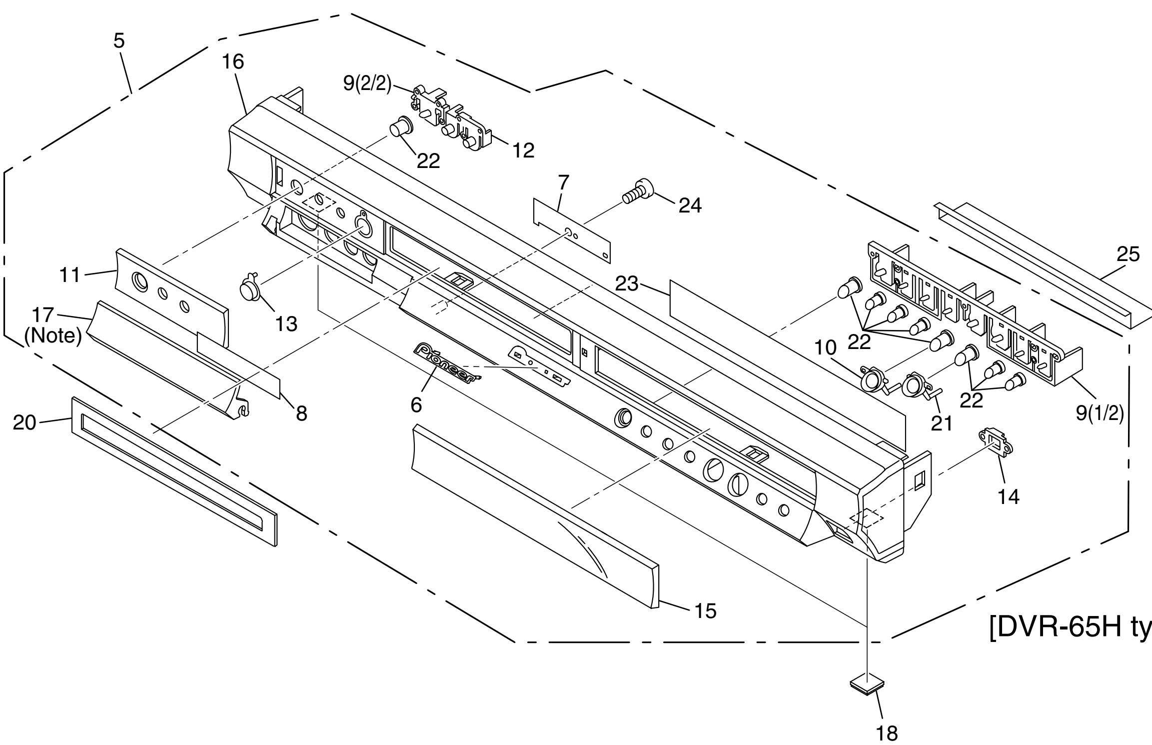
Mark	No.	Symbol and Description	DVR-520H-S /KU/CA	DVR-520H-S /KUXU/CA	DVR-65H-S /KCXU
	24	Housing Assy (4P)	VKP2348	VKP2335	VKP2335
	49	HDD Badge	VAM1141	VAM1141	Not used
	50	Tray Sheet B	VEC2409	VEC2409	Not used
	50	Tray Sheet	Not used	Not used	VEC2448
	51	Tray Panel	VNK5421	VNK5421	Not used
	54	Rear Panel	VNA2704	VNA2704	VNA2737
	56	Tray Panel Base	Not used	Not used	VNK5432
	57	Tray Panel Lens	Not used	Not used	VNK5592

2.3 FRONT PANEL





Note : When replacing the jack door, first fully open it.
If the jack door is not fully open during replacement,
it may unexpectedly fall out after being replaced.



FRONT PANEL parts List

Mark	No.	Description	Part No.
	1	FLKY Assy	VWG2489
	2	KIRB Assy	VWG2493
	3	Flexible Cable (19P)	See Contrast table (2)
	4	Flexible Cable (7P)	See Contrast table (2)
	5	Front Panel Assy	See Contrast table (2)
	6	Pioneer Name Plate	See Contrast table (2)
	7	Door Spring	VBK1151
NSP	8	Mirror Sheet	VHL1082
NSP	9	Main Key	See Contrast table (2)
NSP	10	REC Ring	VNK5425
NSP	11	Sub Panel	See Contrast table (2)
NSP	12	Power Key	VNK5480
NSP	13	IR Window	See Contrast table (2)
NSP	14	DV Cover	VNK5451
NSP	15	FL Lens	See Contrast table (2)
NSP	16	Front Panel	See Contrast table (2)
	17	Jack Door	VNK5494
	18	Rubber Foot	VEB1349
	19	Drive Sheet	VEC2345
	20	Panel Sheet	See Contrast table (2)
NSP	21	Copy Ring	VNK5523
NSP	22	Cap	See Contrast table (2)
	23	FL Filter	See Contrast table (2)
	24	Screw	BPZ30P080FTC
	25	Sheet S	See Contrast table (2)

(2) CONTRAST TABLE

DVR-520H-S/KU/CA, KUXU/CA and DVR-65H/KCXU are constructed the same except for the following :

Mark	No.	Symbol and Description	DVR-520H-S /KU/CA	DVR-520H-S /KUXU/CA	DVR-65H-S /KCXU
	3	Flexible Cable (19P)	VDA2016	VDA2002	VDA2002
	4	Flexible Cable (7P)	VDA2019	VDA2005	VDA2005
	5	Front Panel Assy	VXA2645	VXA2645	VXA2649
	6	Pioneer Name Plate	VAM1146	VAM1146	VAM1147
NSP	9	Main Key	VNK5420	VNK5420	VNK5436
NSP	11	Sub Panel	VNK5483	VNK5483	VNK5526
NSP	13	IR Window	VNK5423	VNK5423	Not used
NSP	15	FL Lens	VNK5422	VNK5422	VNK5593
NSP	16	Front Panel	VNK5441	VNK5441	VNK5527
	20	Panel Sheet	VEC2446	VEC2446	Not used
NSP	22	Cap	Not used	Not used	VNK5437
	23	FL Filter	Not used	Not used	VEC2421
	25	Sheet S	Not used	Not used	VEC2426

A

B

C

D

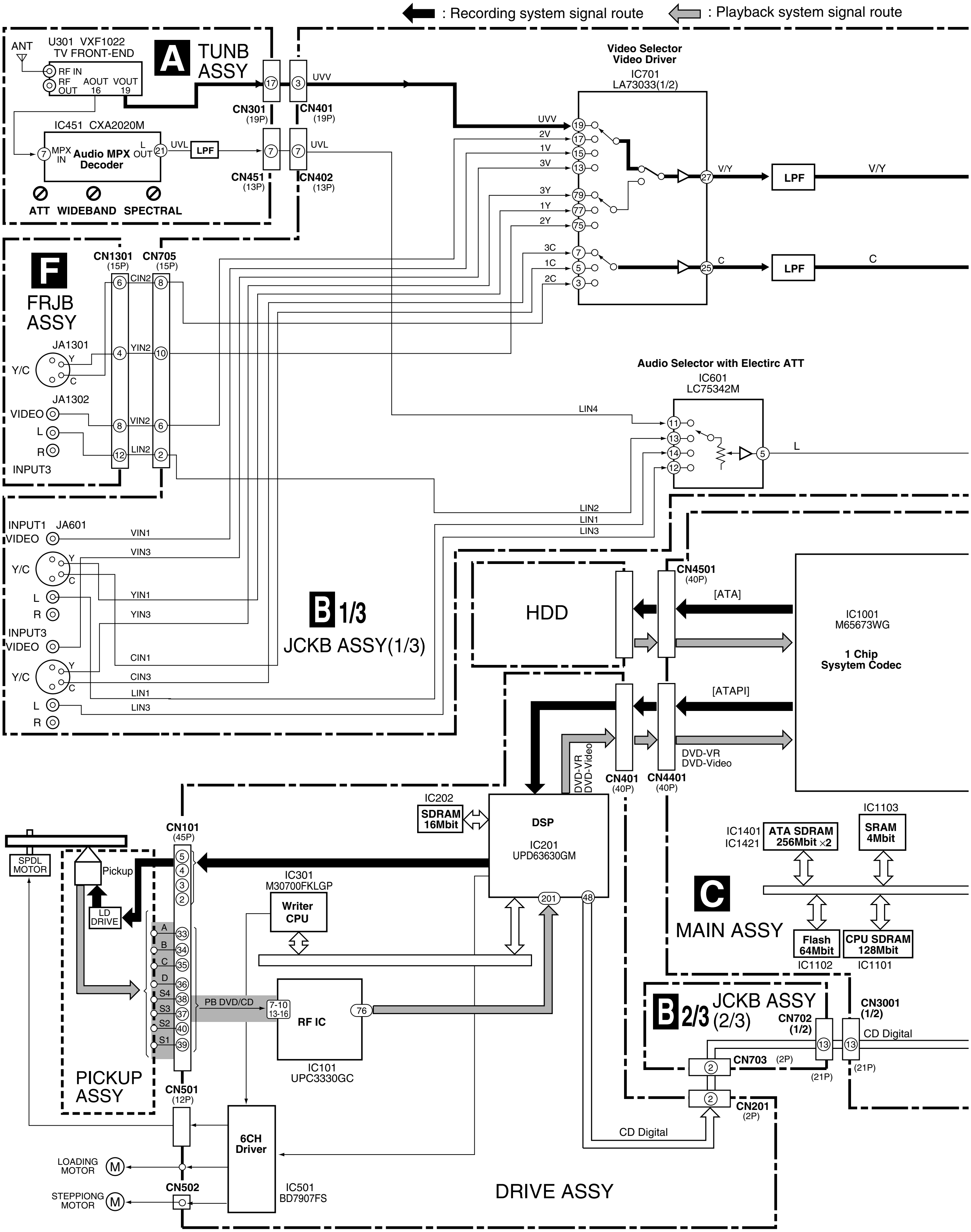
E

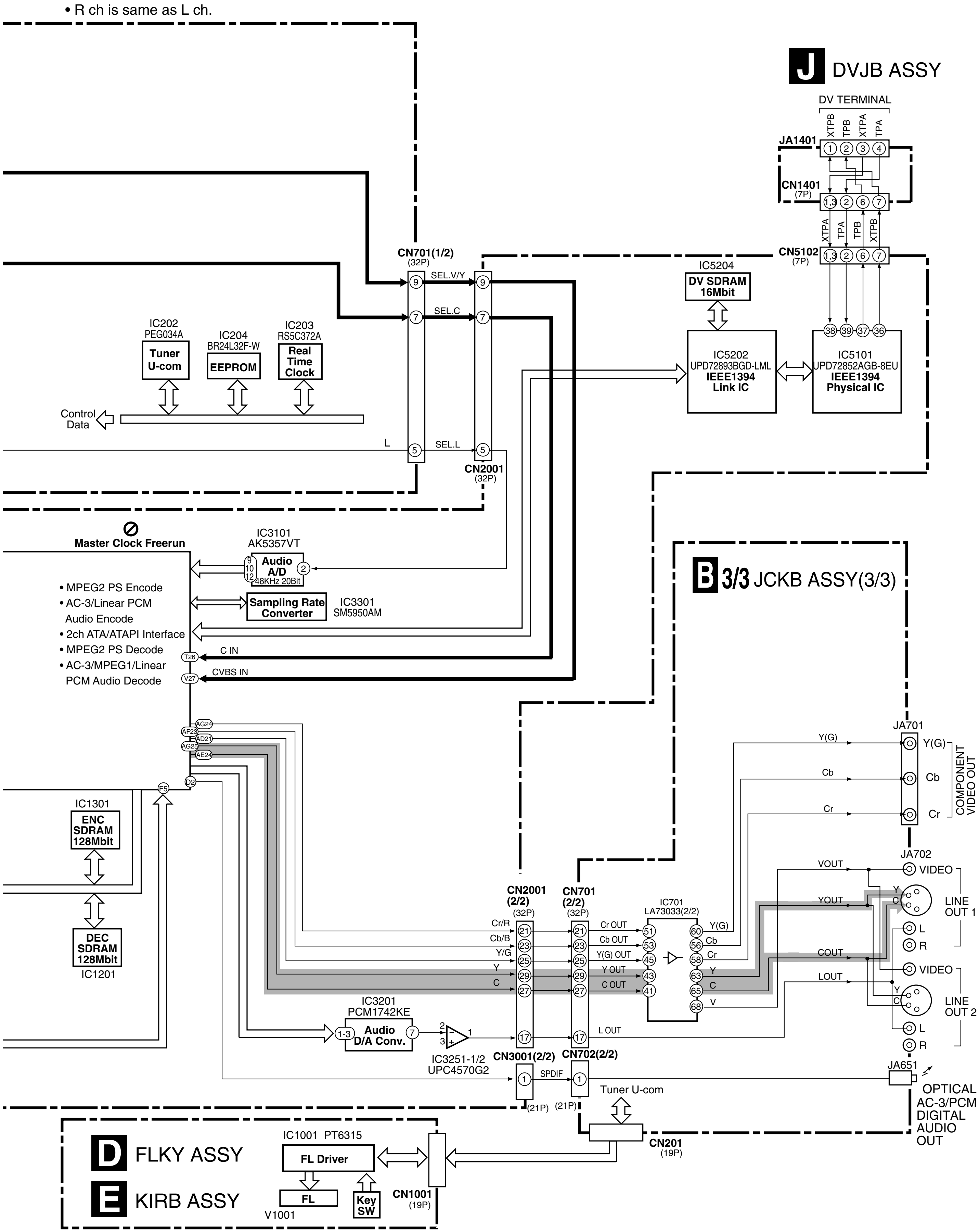
F

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

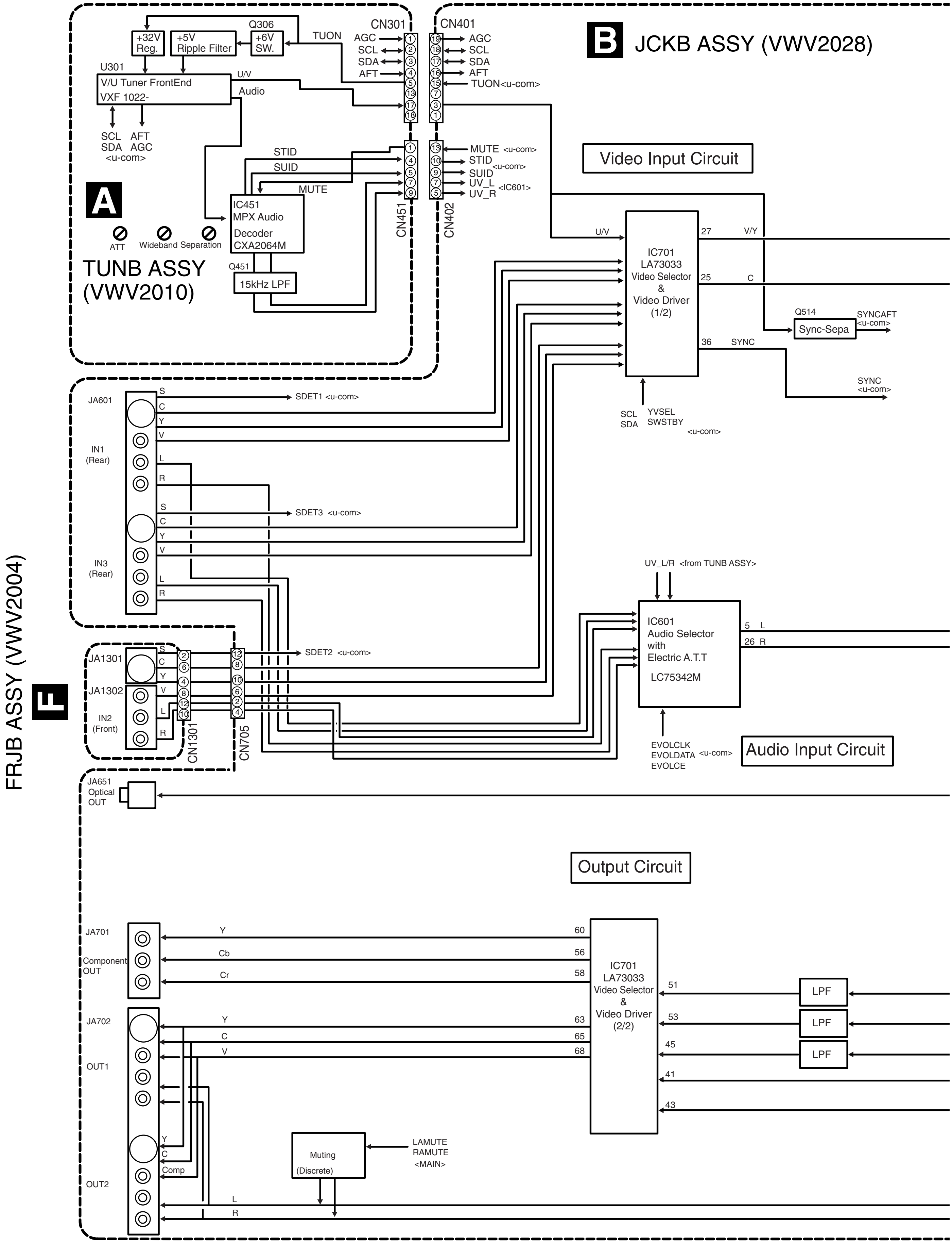
3.1 BLOCK DIAGRAM

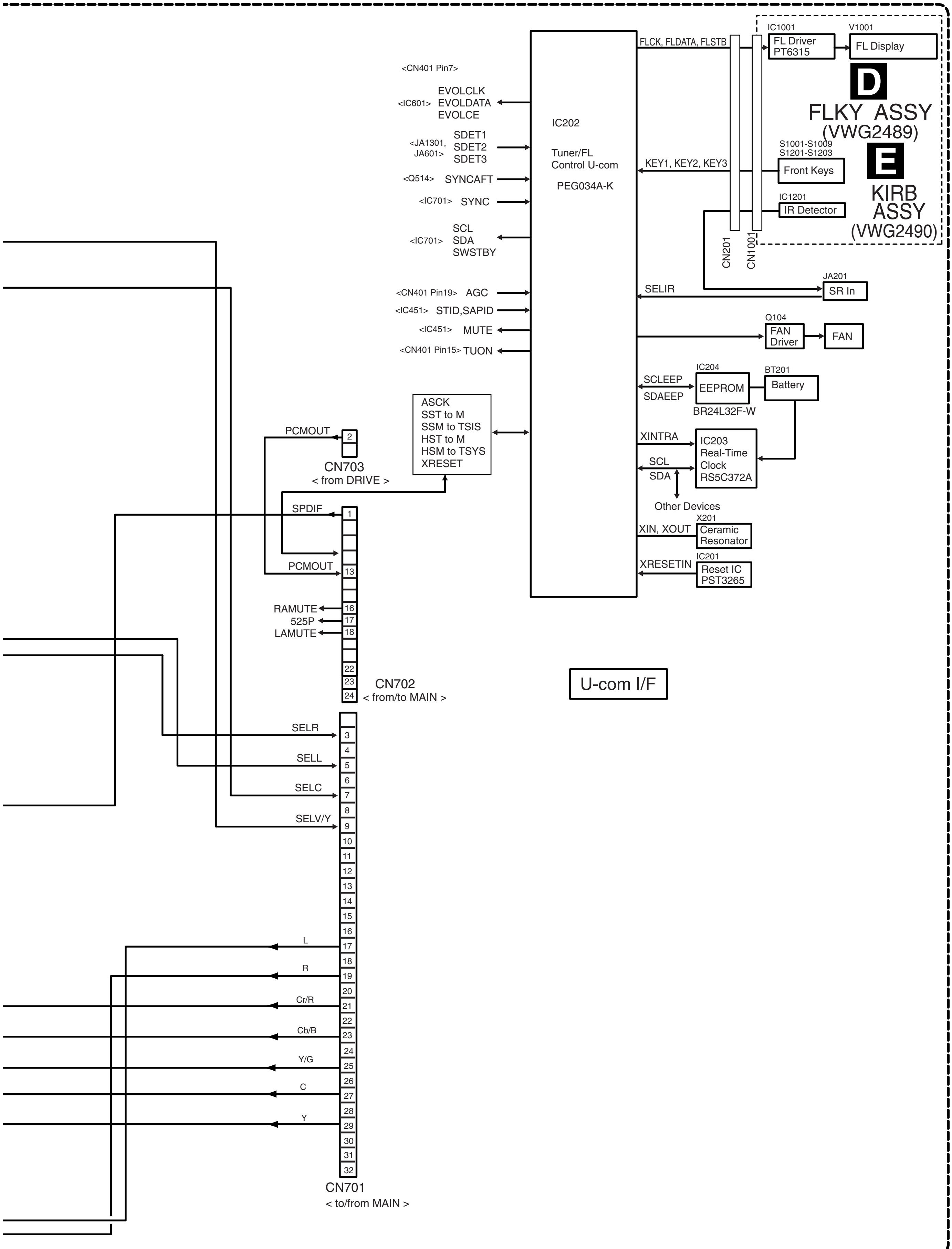
3.1.1 OVERALL BLOCK DIAGRAM



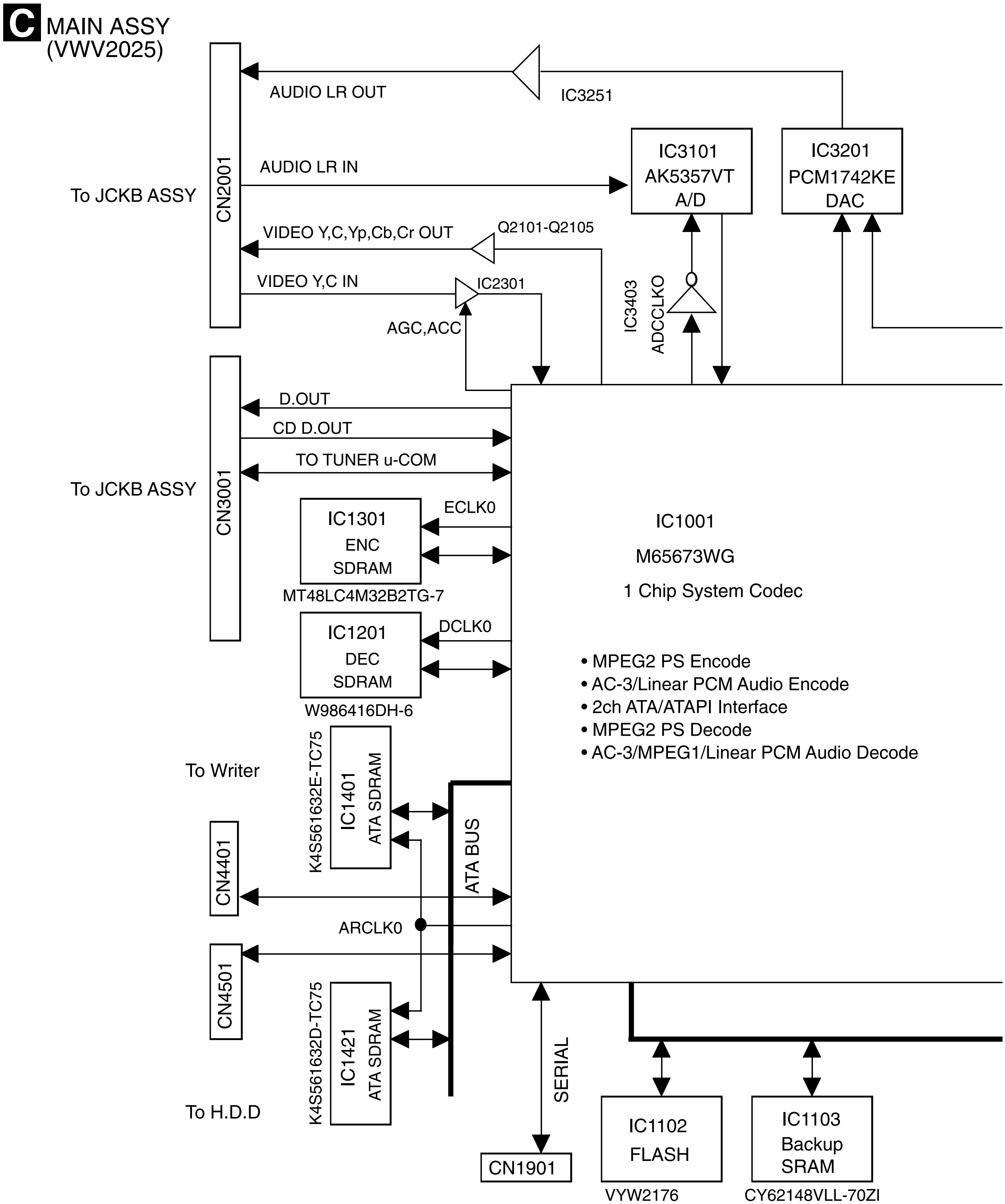

• R ch is same as L ch.
J DVJB ASSY
DV TERMINAL
XTPB TPB XTPA TPA
JA1401
CN1401 (7P)
CN5102 (7P)
IC5204
DV SDRAM 16Mbit
IC5202 UPD72893BGD-LML IEEE1394 Link IC
IC5101 UPD72852AGB-8EU IEEE1394 Physical IC
CN701(1/2) (32P)
SEL.V/Y
SEL.C
SEL.L
CN2001 (32P)
IC202 PEG034A Tuner U-com
IC204 BR24L32F-W EEPROM
IC203 RS5C372A Real Time Clock
Control Data
Master Clock Freerun
IC3101 AK5357VT
Audio A/D 48KHz 20Bit
Sampling Rate Converter
IC3301 SM5950AM
• MPEG2 PS Encode
• AC-3/Linear PCM Audio Encode
• 2ch ATA/ATAPI Interface
• MPEG2 PS Decode
• AC-3/MPEG1/Linear PCM Audio Decode
C IN
CVBS IN
B 3/3 JCKB ASSY(3/3)
IC1301 ENC SDRAM 128Mbit
DEC SDRAM 128Mbit IC1201
JA701
Y(G) Cb Cr
COMPONENT VIDEO OUT
JA702
VIDEO
LINE OUT 1
LINE OUT 2
VOUT YOUT COUT LOUT
CN2001 (2/2) (32P)
CN701 (2/2) (32P)
Cr/R Cb/B Y/G Y C
Cr OUT Cb OUT Y(G) OUT Y OUT C OUT
IC701 LA73033(2/2)
IC3201 PCM1742KE
Audio D/A Conv.
IC3251-1/2 UPC4570G2
L OUT
CN3001(2/2) (21P)
CN702(2/2) (21P)
SPDIF
JA651
OPTICAL AC-3/PCM DIGITAL AUDIO OUT
Tuner U-com
CN201 (19P)
D FLKY ASSY
E KIRB ASSY
IC1001 PT6315
FL Driver
FL
V1001
Key SW
CN1001 (19P)

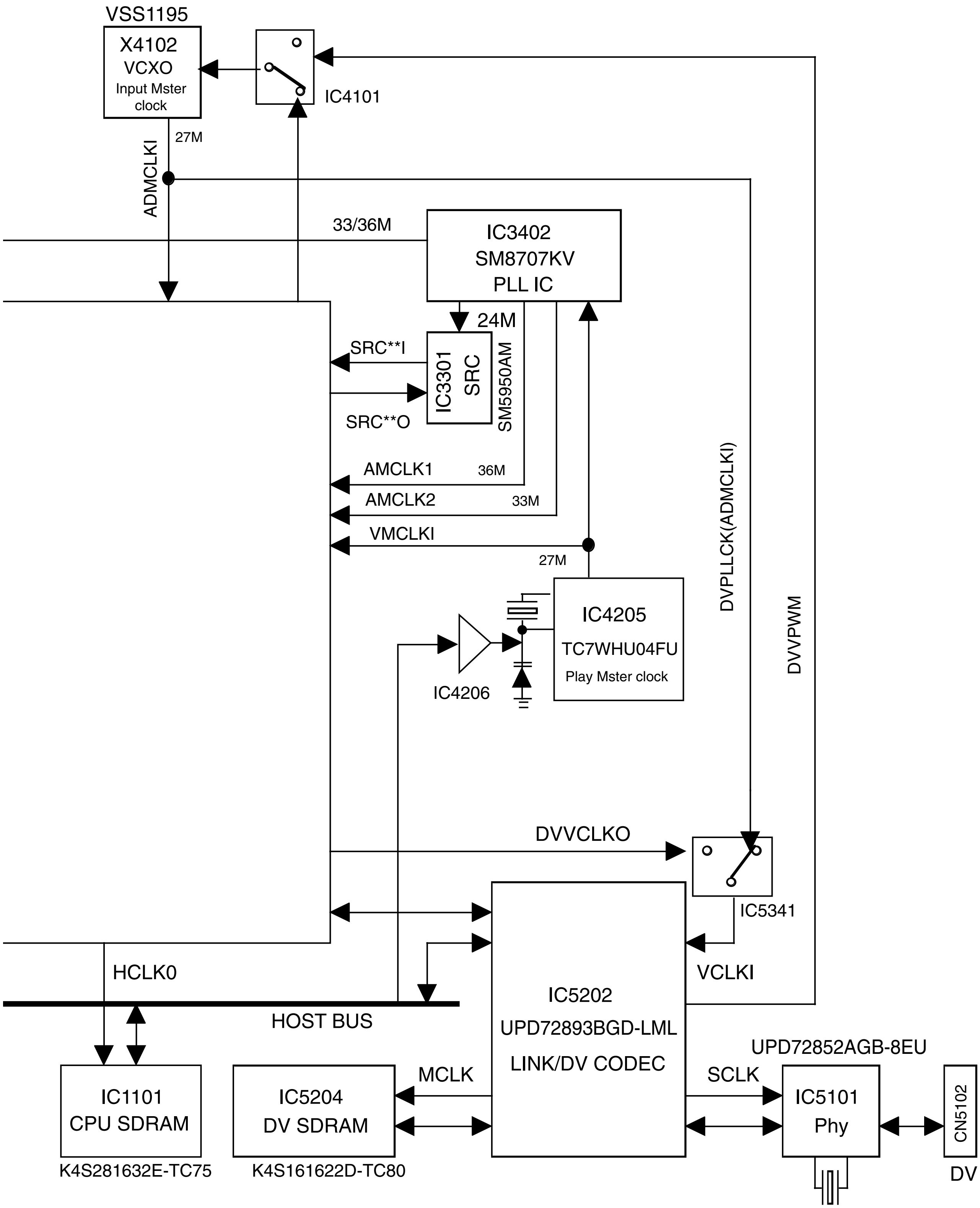
3.1.2 TUNB and JCKB ASSY BLOCK DIAGRAM



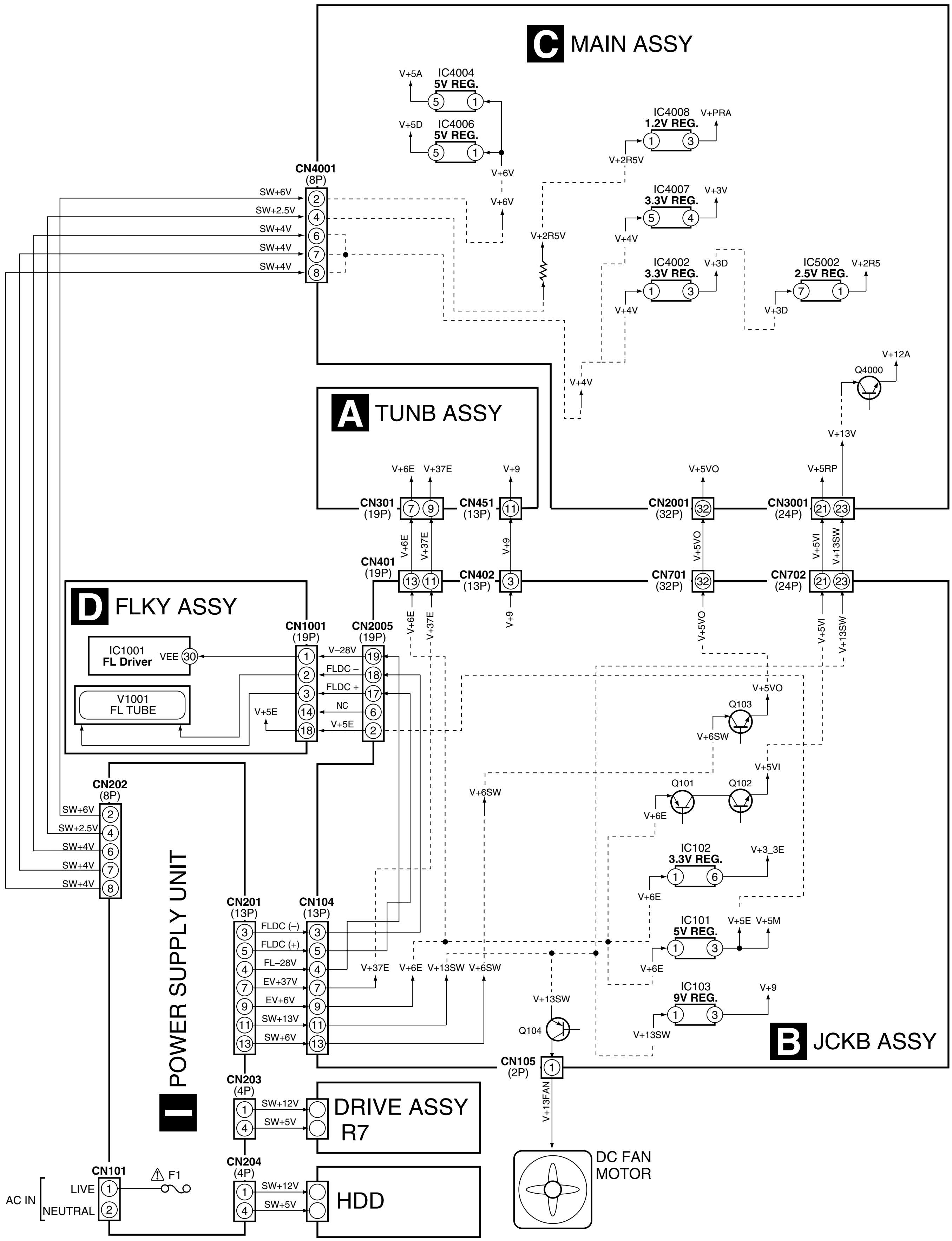

IC1001
FL Driver PT6315
V1001
FL Display
D
FLKY ASSY (VWG2489)
FLCK, FLDATA, FLSTB
<CN401 Pin7>
<IC601> EVOLCLK EVOLDATA EVOLCE
IC202
Tuner/FL Control U-com
PEG034A-K
<JA1301, JA601> SDET1 SDET2 SDET3
<Q514> SYNCAFT
<IC701> SYNC
<IC701> SCL SDA SWSTBY
S1001-S1009 S1201-S1203
Front Keys
KEY1, KEY2, KEY3
E
KIRB ASSY (VWG2490)
IC1201
IR Detector
CN201
CN1001
JA201
SR In
SELIR
<CN401 Pin19> AGC
<IC451> STID,SAPID
<IC451> MUTE
<CN401 Pin15> TUON
Q104
FAN Driver
FAN
IC204
EEPROM
BR24L32F-W
SCLEEP
SDAEEP
BT201
Battery
ASCK
SST to M
SSM to TSIS
HST to M
HSM to TSYS
XRESET
XINTRA
IC203
Real-Time Clock
RS5C372A
SCL
SDA
Other Devices
X201
Ceramic Resonator
XIN, XOUT
IC201
Reset IC PST3265
XRESETIN
PCMOUT
CN703
< from DRIVE >
SPDIF
PCMOUT
RAMUTE
525P
LAMUTE
CN702
< from/to MAIN >
U-com I/F
SELR
SELL
SELC
SELV/Y
L
R
Cr/R
Cb/B
Y/G
C
Y
CN701
< to/from MAIN >

3.1.3 MAIN ASSY BLOCK DIAGRAM

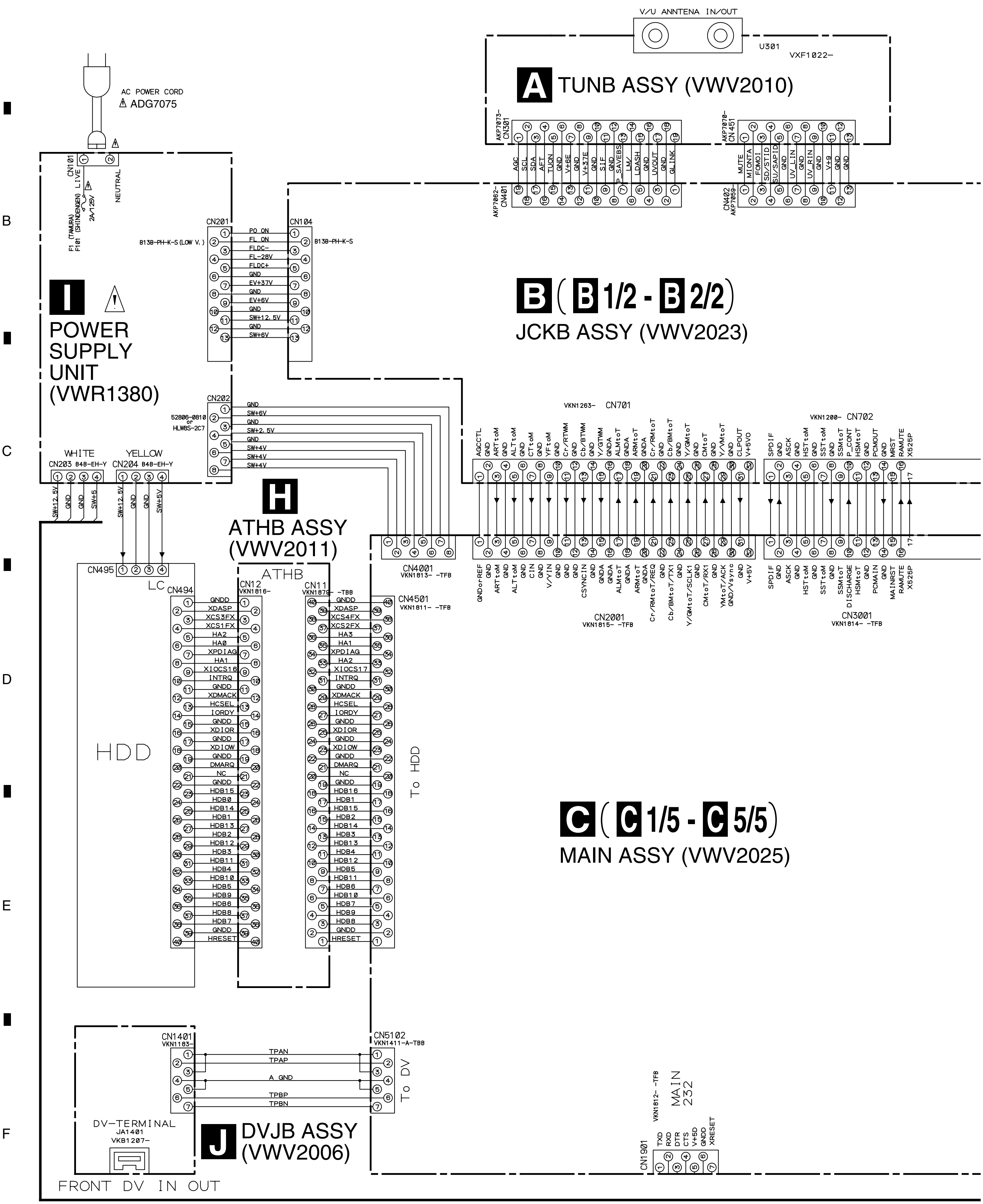



VSS1195
X4102
VCXO
Input Mster clock
IC4101
27M
ADMCLKI
33/36M
IC3402
SM8707KV
PLL IC
24M
SRC**I
IC3301
SRC
SM5950AM
SRC**O
AMCLK1
36M
AMCLK2
33M
VMCLKI
27M
IC4205
TC7WHU04FU
Play Mster clock
IC4206
DVPLLCK(ADMCLKI)
DVVPWM
DVVCLKO
IC5341
VCLKI
HCLK0
HOST BUS
IC5202
UPD72893BGD-LML
LINK/DV CODEC
MCLK
SCLK
UPD72852AGB-8EU
IC1101
CPU SDRAM
K4S281632E-TC75
IC5204
DV SDRAM
K4S161622D-TC80
IC5101
Phy
CN5102
DV

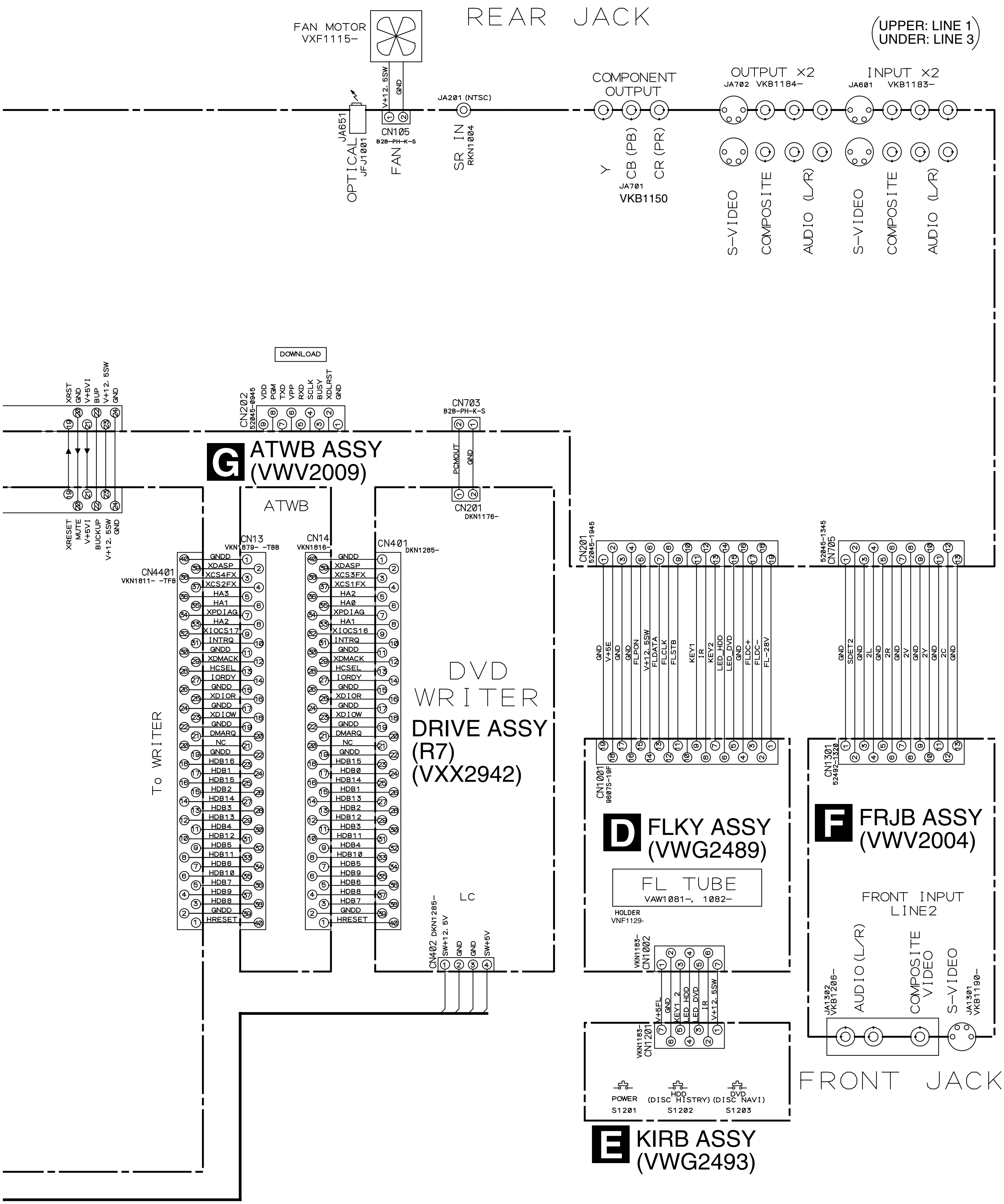
3.1.4 POWER BLOCK DIAGRAM



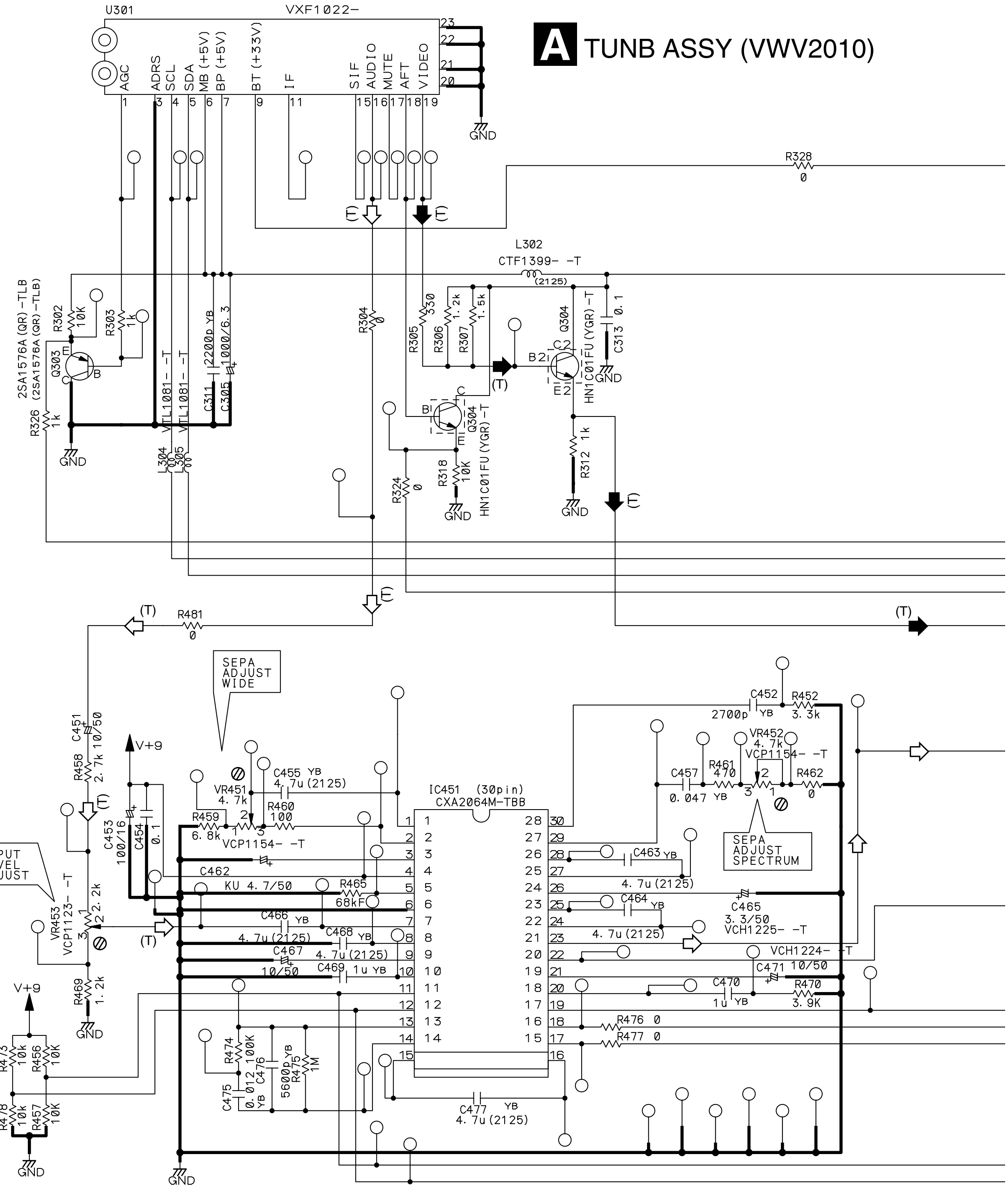
3.2 OVERALL WIRING DIAGRAM



- When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- (marked box) : The power supply is shown with the marked box.



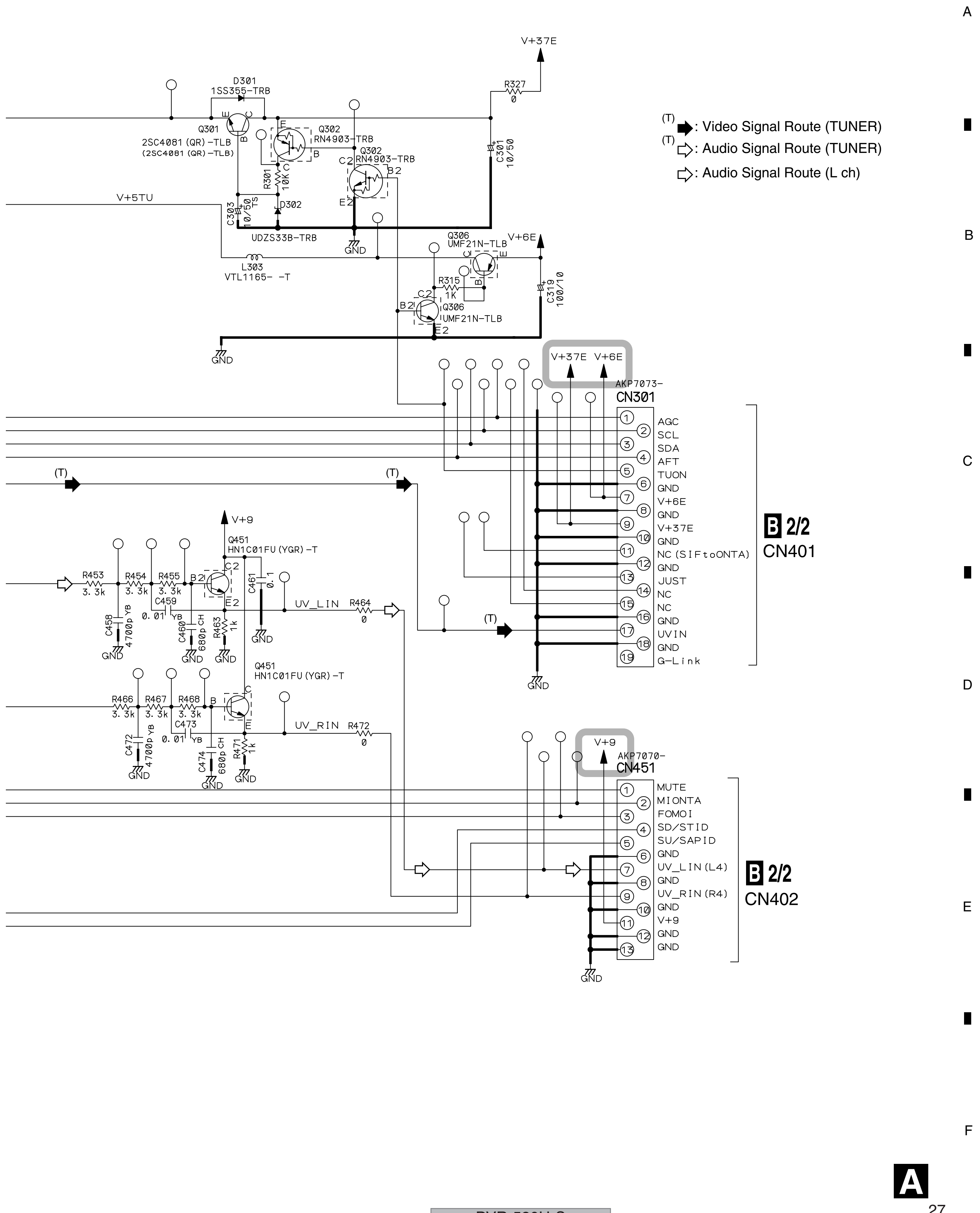
3.3 TUNB ASSY



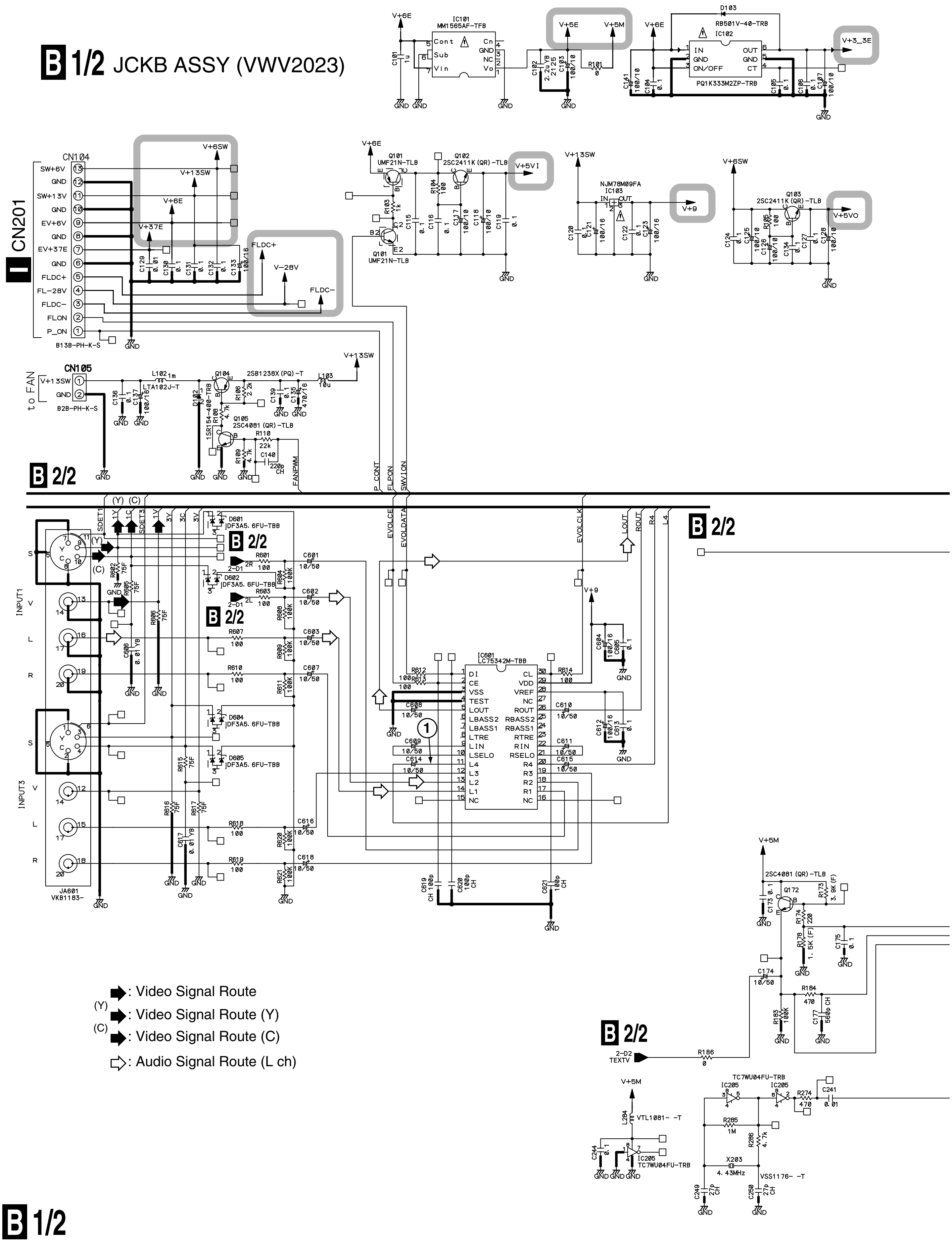
IC451 CXA2064M-TBB

Pin	Name	Name	Pin
1	STIN	VE	30
2	SUBOUT	VEWGT	29
3	NOISETC	SAPOUT	28
4	Vcc	SAPIN	27
5	IREF	VETC	26
6	GND	VEOUT	25
7	COMPIN	VCAIN	24
8	SAPTC	TVOUT-L	23
9	VGR	TVOUT-R	22
10	PLINT	VCATC	21
11	STID	VCAWGT	20
12	SAPID	MUTE	19
13	PCINT2	M1	18
14	PCINT1	FOMO	17
15	MAINOUT	MAININ	16

A


A
B
C
D
E
F
V+37E
D301
1SS355-TRB
R327
0
Q301
2SC4081(QR)-TLB
(2SC4081(QR)-TLB)
Q302
RN4903-TRB
C301
10/50
R301
10K
V+5TU
C303
10/50
D302
UDZS33B-TRB
GND
Q306
UMF21N-TLB
V+6E
L303
VTL1165- -T
R315
1K
C319
100/10
GND
(T) : Video Signal Route (TUNER)
(T) : Audio Signal Route (TUNER)
: Audio Signal Route (L ch)
V+37E V+6E
AKP7073-
CN301
1 AGC
2 SCL
3 SDA
4 AFT
5 TUON
6 GND
7 V+6E
8 GND
9 V+37E
10 GND
11 NC (SIFtoONTA)
12 GND
13 JUST
14 NC
15 NC
16 GND
17 UVIN
18 GND
19 G-Link
B 2/2
CN401
V+9
Q451
HN1C01FU(YGR)-T
R453 3.3k
R454 3.3k
R455 3.3k
C459 0.01 YB
C458 4700p YB
C460 680p CH
R463 1k
C461 0.1
UV_LIN
R464 0
GND
R466 3.3k
R467 3.3k
R468 3.3k
C473 0.01 YB
C472 4700p YB
C474 680p CH
R471 1k
UV_RIN
R472 0
V+9
AKP7070-
CN451
1 MUTE
2 MIONTA
3 FOMOI
4 SD/STID
5 SU/SAPID
6 GND
7 UV_LIN (L4)
8 GND
9 UV_RIN (R4)
10 GND
11 V+9
12 GND
13 GND
B 2/2
CN402
A

3.4 JCKB ASSY(1/2)



: Video Signal Route

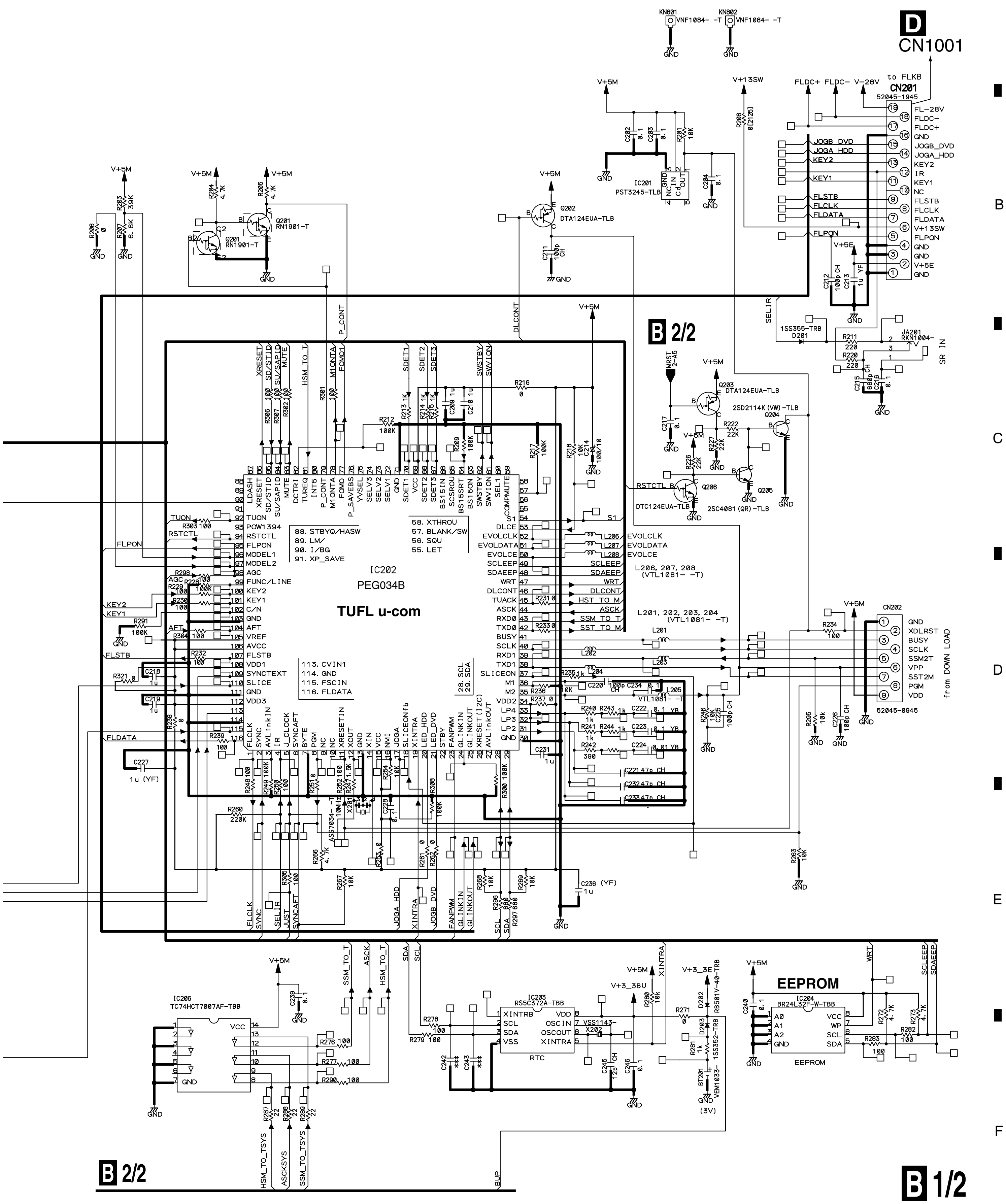
(Y) : Video Signal Route (Y)

(C) : Video Signal Route (C)

: Audio Signal Route (L ch)

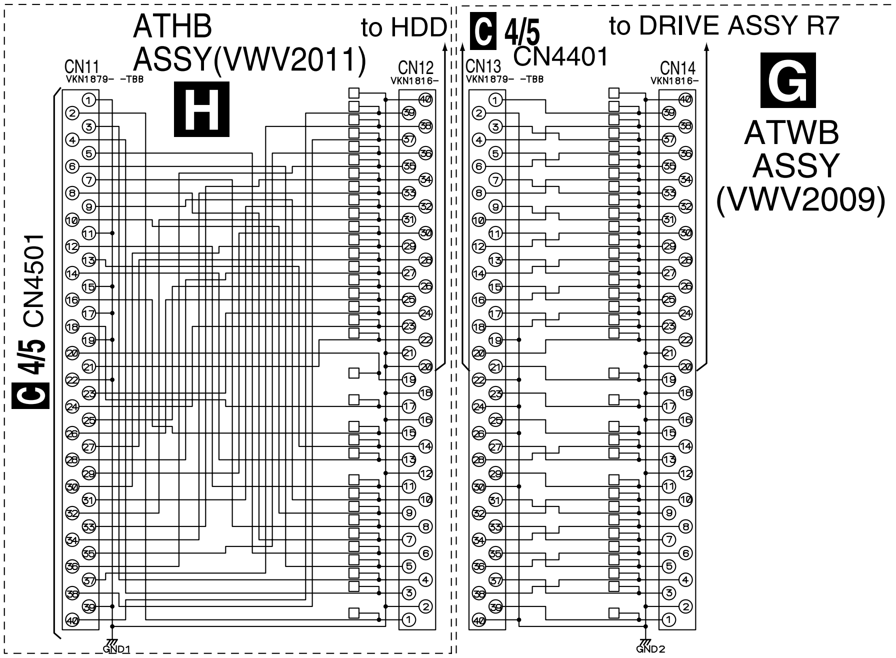
5 6 7 8

A B C D E F



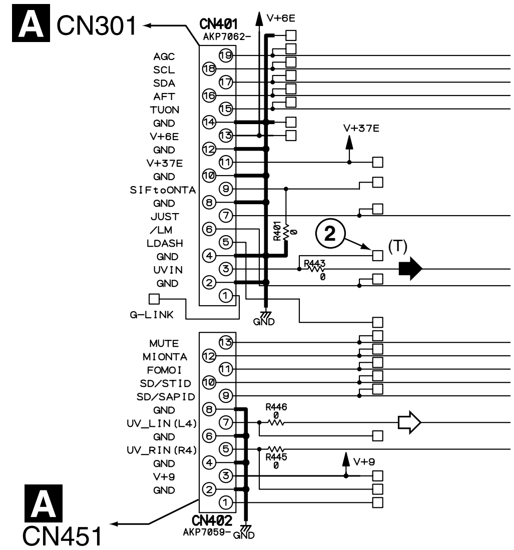
B 1/2

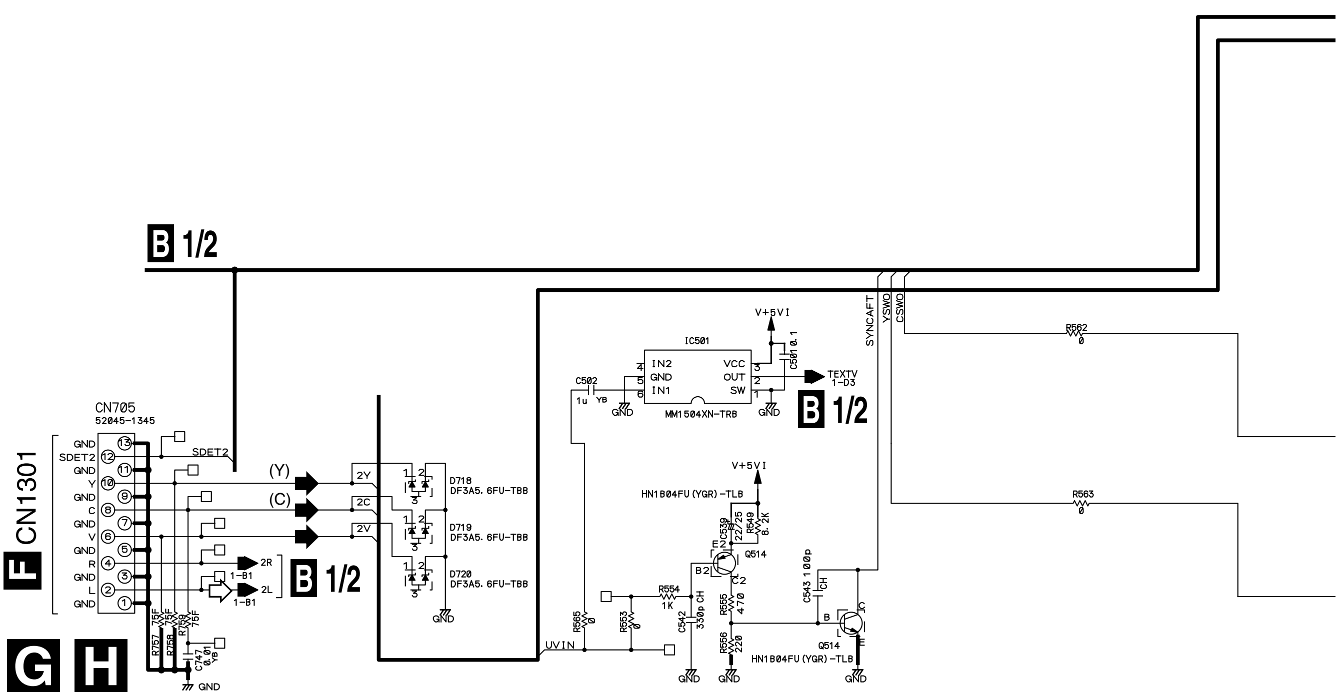
3.5 JCKB(2/2), ATWB and ATHB ASSYS



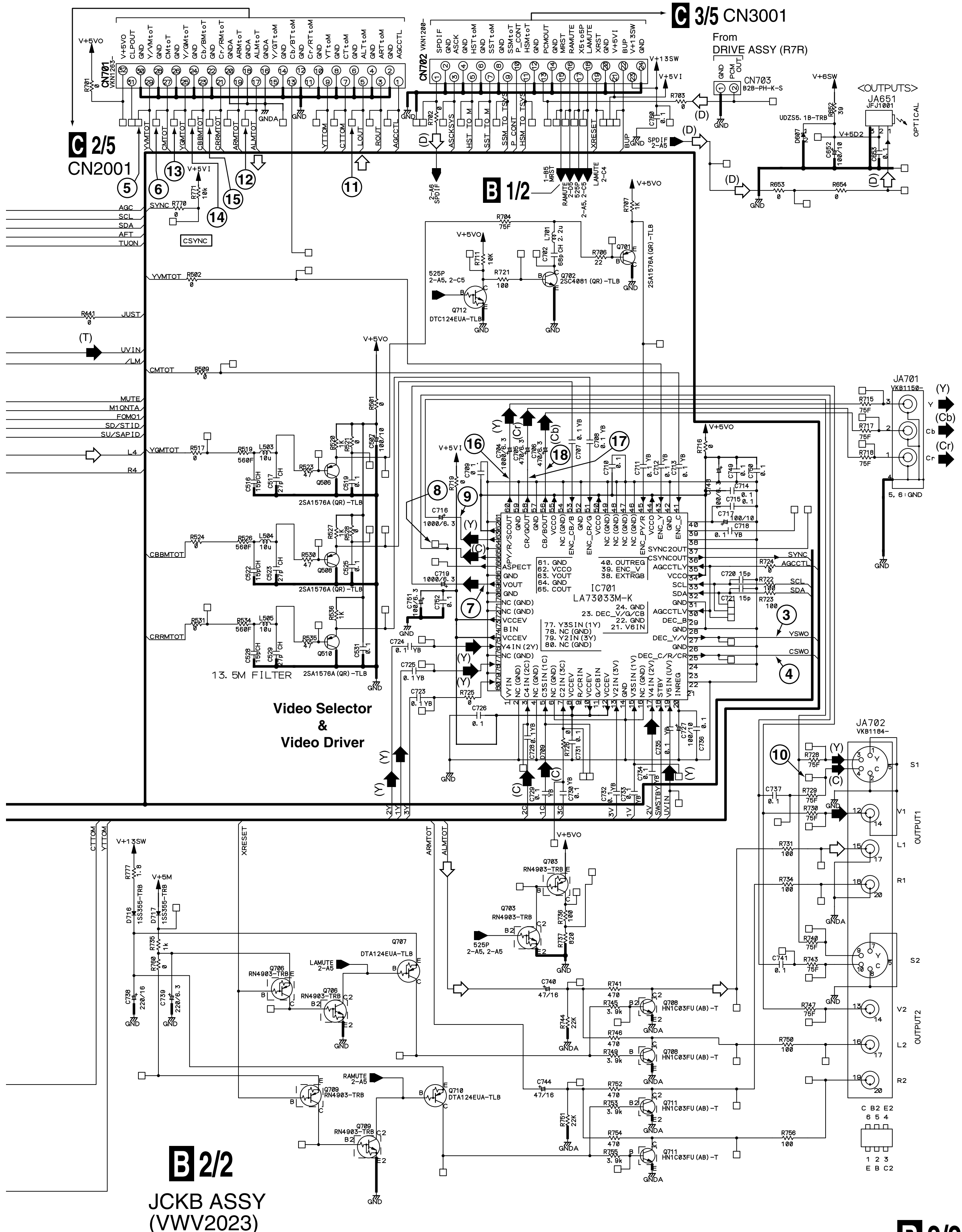
(T) (Y) (C) (Cb) (Cr) (D)

- : Video Signal Route
- (T) : Video Signal Route (TUNER)
- (Y) : Video Signal Route (Y)
- (C) : Video Signal Route (C)
- (Cb) : Video Signal Route (Cb)
- (Cr) : Video Signal Route (Cr)
- : Audio Signal Route (L ch)
- (D) : Audio Signal Route (DIGITAL)





B 2/2 G H

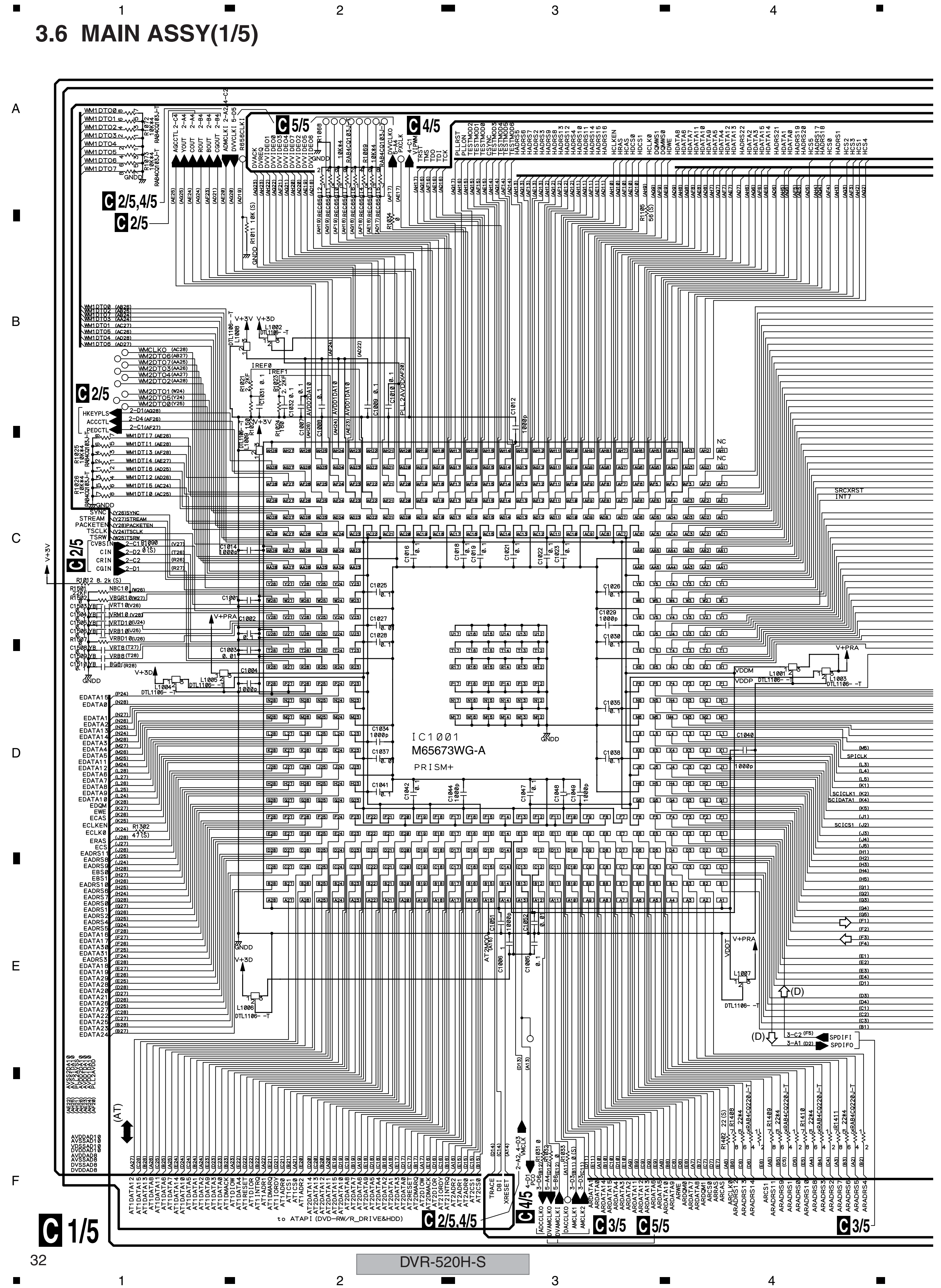


C 3/5 CN3001
From
DRIVE ASSY (R7R)
CN701
VKN1263-
CN702
VKN1200-
CN703
B2B-PH-K-S
<OUTPUTS>
JA651
JFJ1001
OPTICAL
C 2/5
CN2001
B 1/2
CSYNC
IC701
LA73033M-K
JA701
VKB1150-
JA702
VKB1184-
OUTPUT1
OUTPUT2
13.5M FILTER
Video Selector
&
Video Driver
B 2/2
JCKB ASSY
(VWV2023)

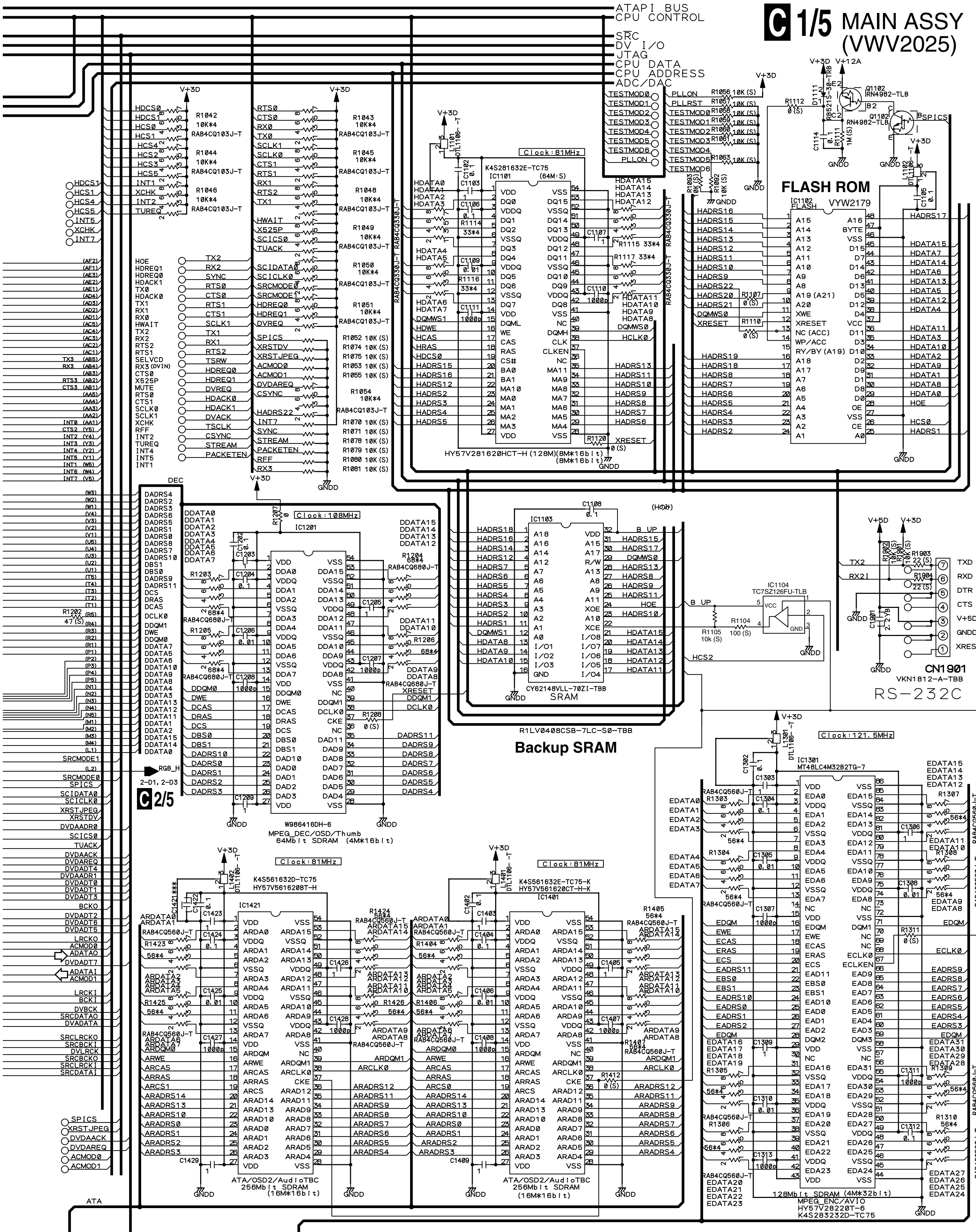
A
B
C
D
E
F

B 2/2

3.6 MAIN ASSY(1/5)



C 1/5 MAIN ASSY (VWV2025)



(AT) ➡: ATA Data Signal Route

(D) ⇨: Audio Signal Route (DIGITAL)

⇨: Audio Signal Route (L ch)

C 1/5

3.7 MAIN ASSY(2/5)

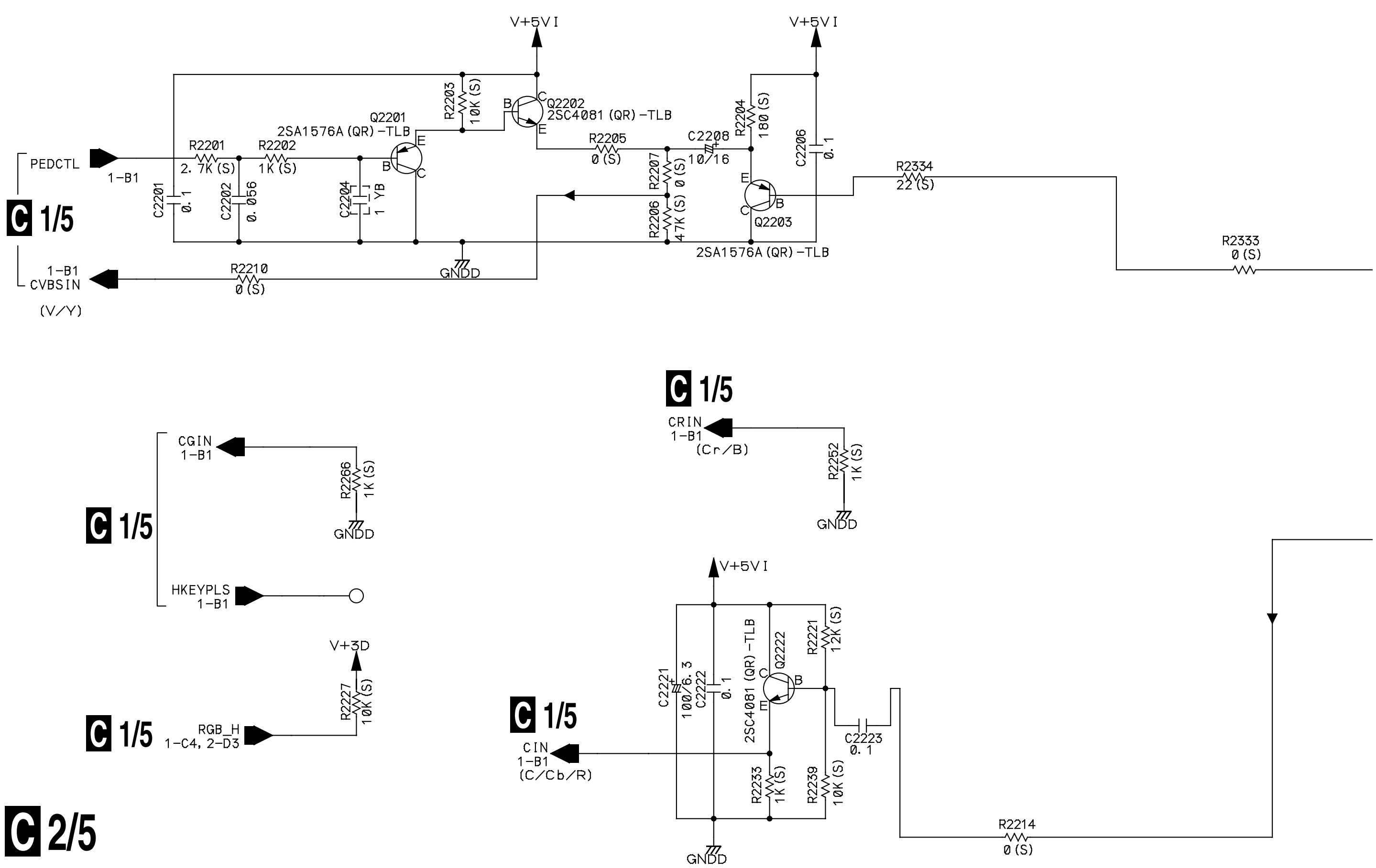
A

C 2/5 MAIN ASSY (VWV2025)

B

C

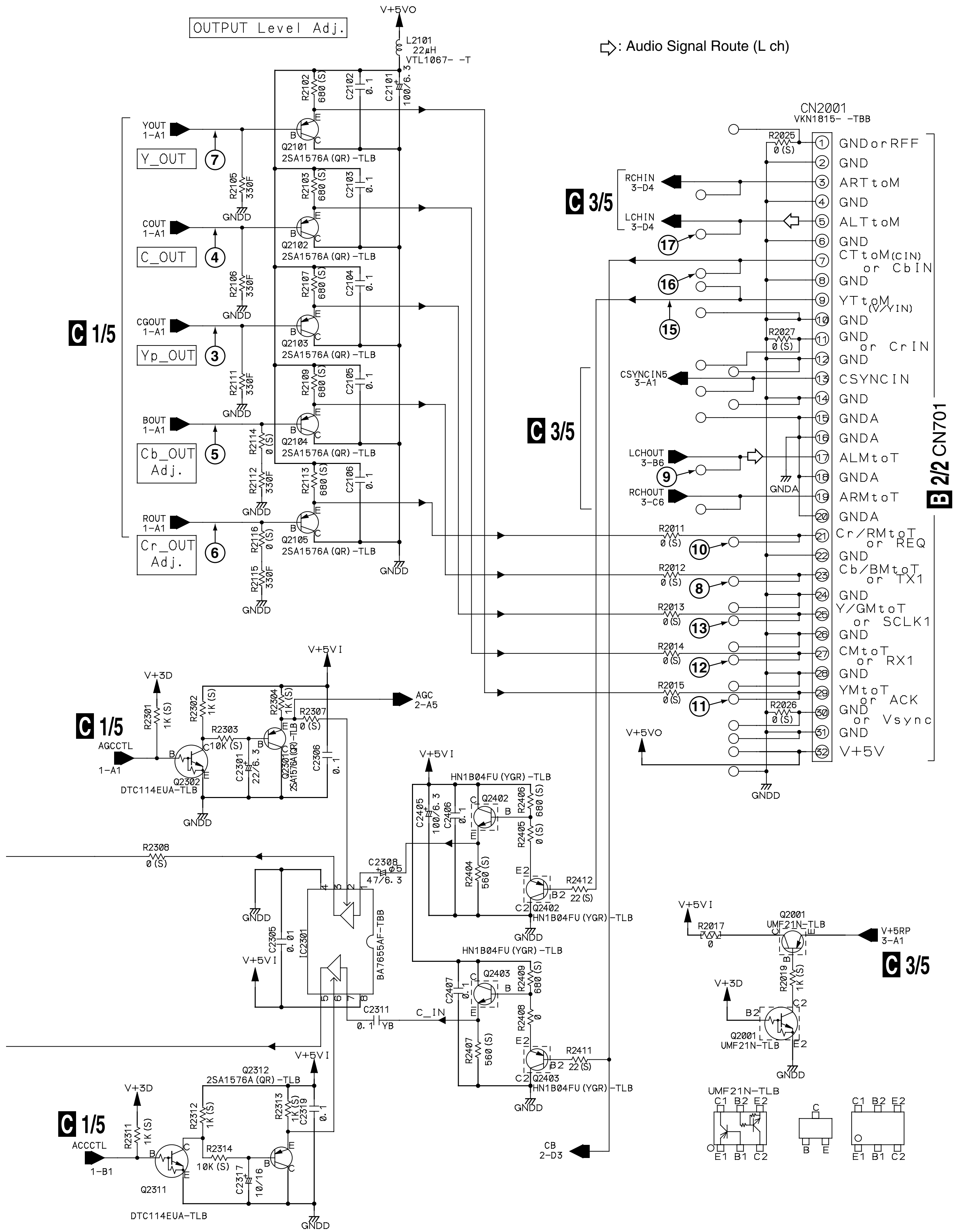
D



E

F

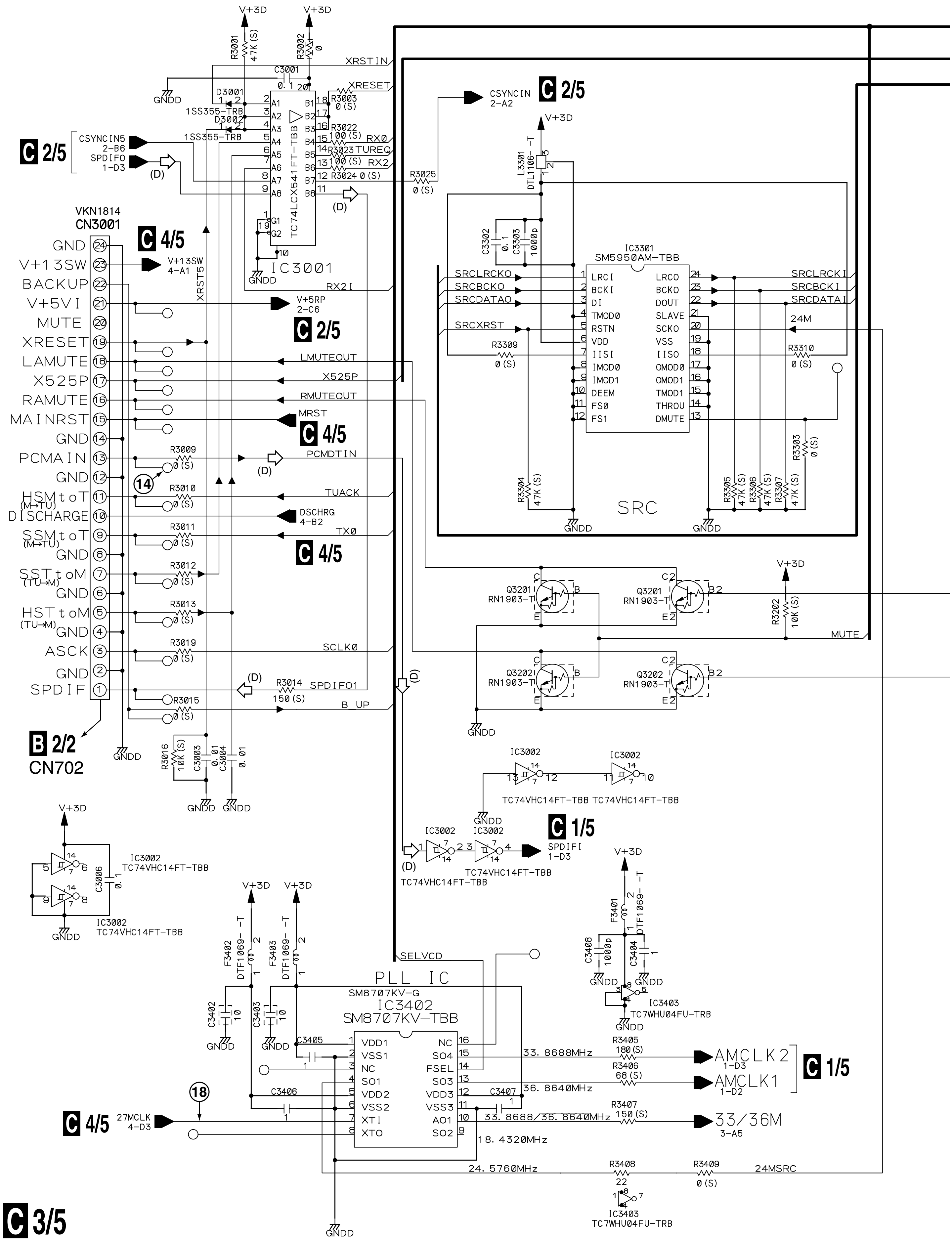
C 2/5



OUTPUT Level Adj.
V+5VO
L2101 22µH VTL1067- -T
: Audio Signal Route (L ch)
CN2001 VKN1815- -TBB
GNDorRFF
GND
ARTtoM
GND
ALTtoM
GND
CTtoM(CIN) or CbIN
GND
YTtoM (V/YIN)
GND
GND or CrIN
GND
CSYNCIN
GND
GNDA
GNDA
ALMtoT
GNDA
ARMtoT
GNDA
Cr/RMtoT or REQ
GND
Cb/BMtoT or TX1
GND
Y/GMtoT or SCLK1
GND
CMtoT or RX1
GND
YMtoT or ACK
GND or Vsync
GND
V+5V
B 2/2 CN701
C 3/5
RCHIN 3-D4
LCHIN 3-D4
CSYNCIN5 3-A1
LCHOUT 3-B6
RCHOUT 3-C6
C 1/5
YOUT 1-A1
Y_OUT
COUT 1-A1
C_OUT
CGOUT 1-A1
Yp_OUT
BOUT 1-A1
Cb_OUT Adj.
ROUT 1-A1
Cr_OUT Adj.
Q2101 2SA1576A(QR)-TLB
Q2102 2SA1576A(QR)-TLB
Q2103 2SA1576A(QR)-TLB
Q2104 2SA1576A(QR)-TLB
Q2105 2SA1576A(QR)-TLB
GNDD
V+5VI
V+3D
AGCCTL 1-A1
Q2302 DTC114EUA-TLB
Q2301 2SA1576A(QR)-TLB
AGC 2-A5
R2308 0(S)
BA7655AF-TBB
IC2301
C_IN
HN1B04FU(YGR)-TLB
Q2402
Q2403
CB 2-D3
ACCCTL 1-B1
Q2311 DTC114EUA-TLB
Q2312 2SA1576A(QR)-TLB
Q2001 UMF21N-TLB
V+5RP 3-A1
UMF21N-TLB
C1 B2 E2
E1 B1 C2
GNDA

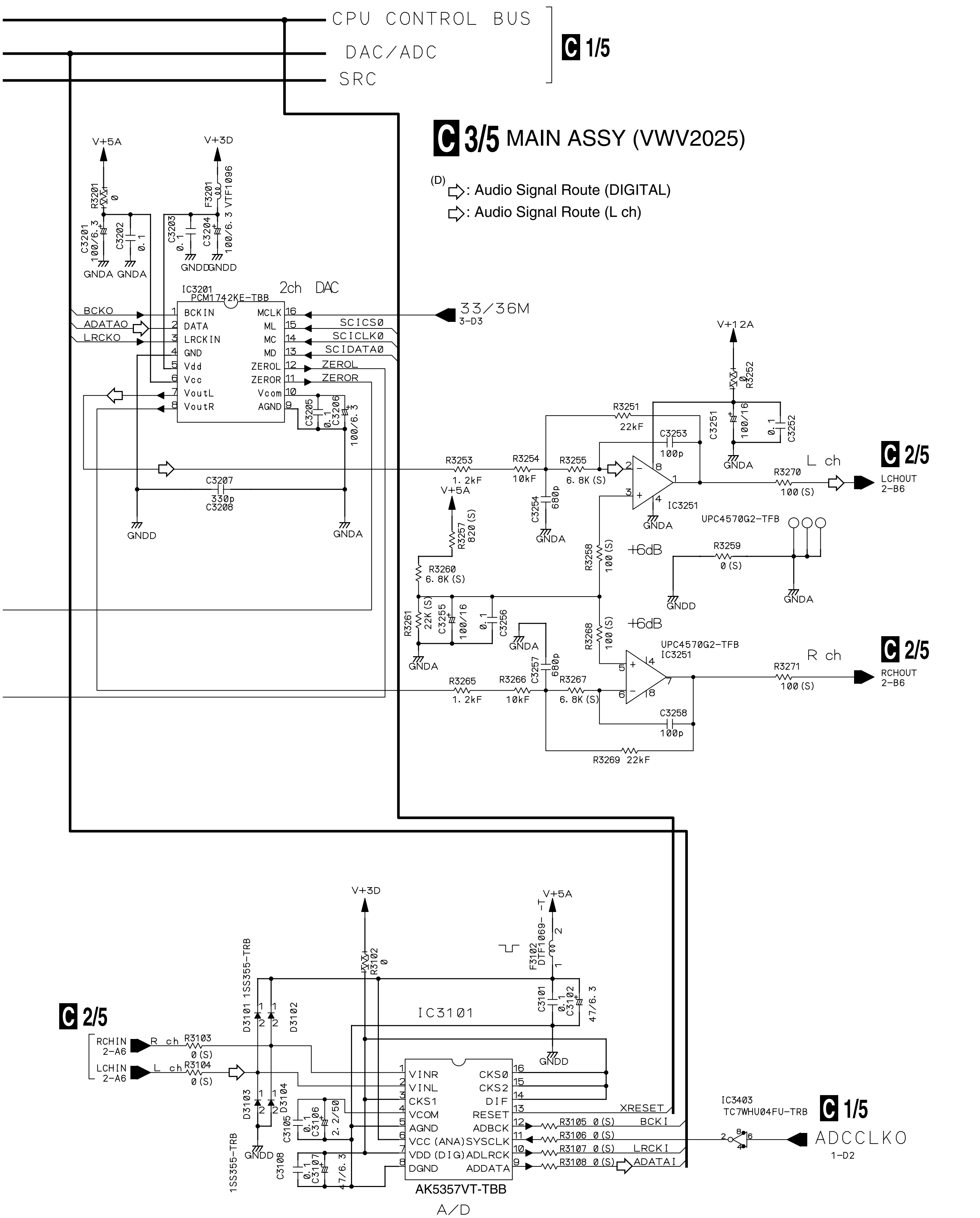
C 2/5

3.8 MAIN ASSY(3/5)

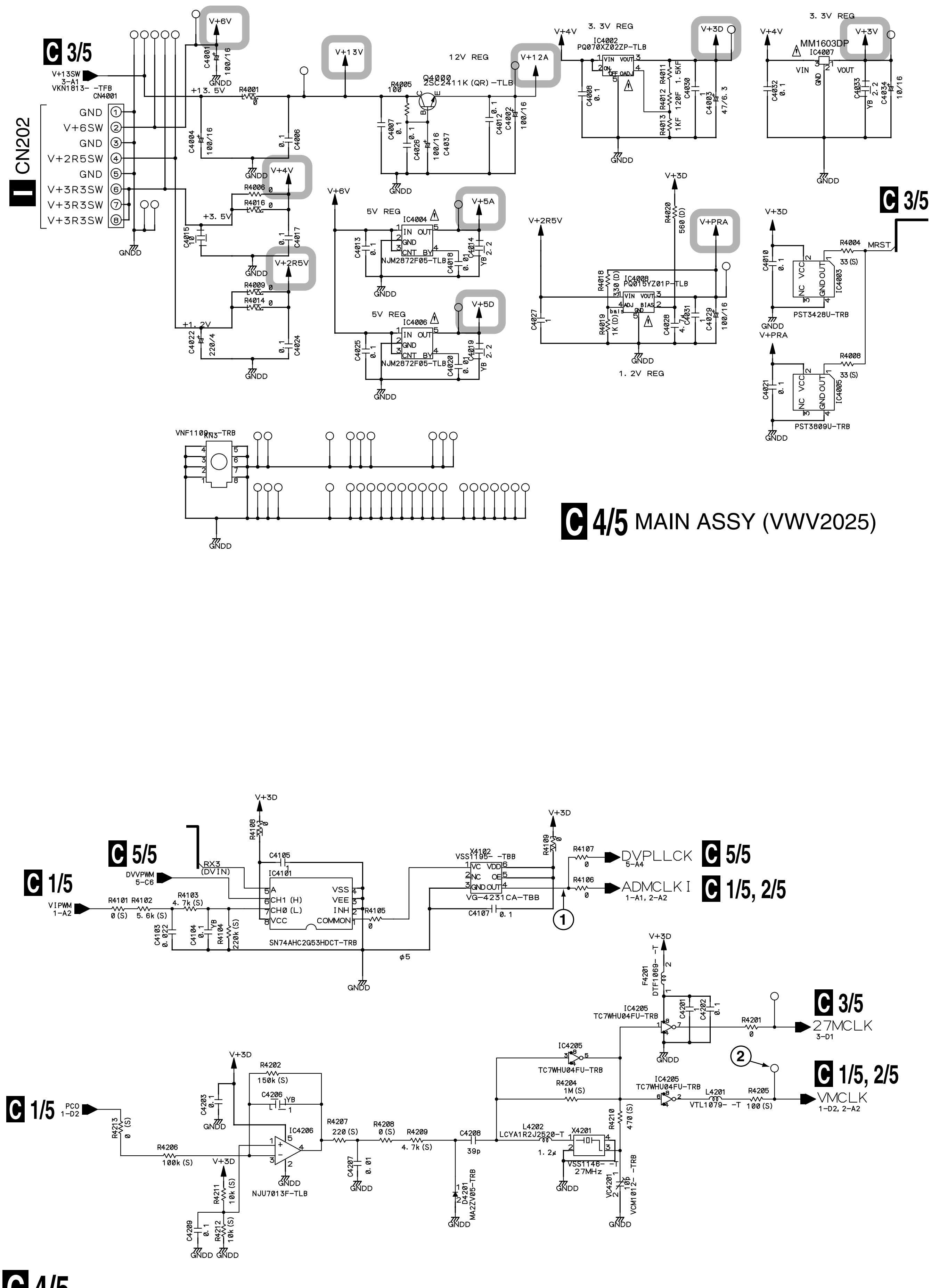


C 3/5 MAIN ASSY (VWV2025)

(D) ⇨: Audio Signal Route (DIGITAL)
⇨: Audio Signal Route (L ch)

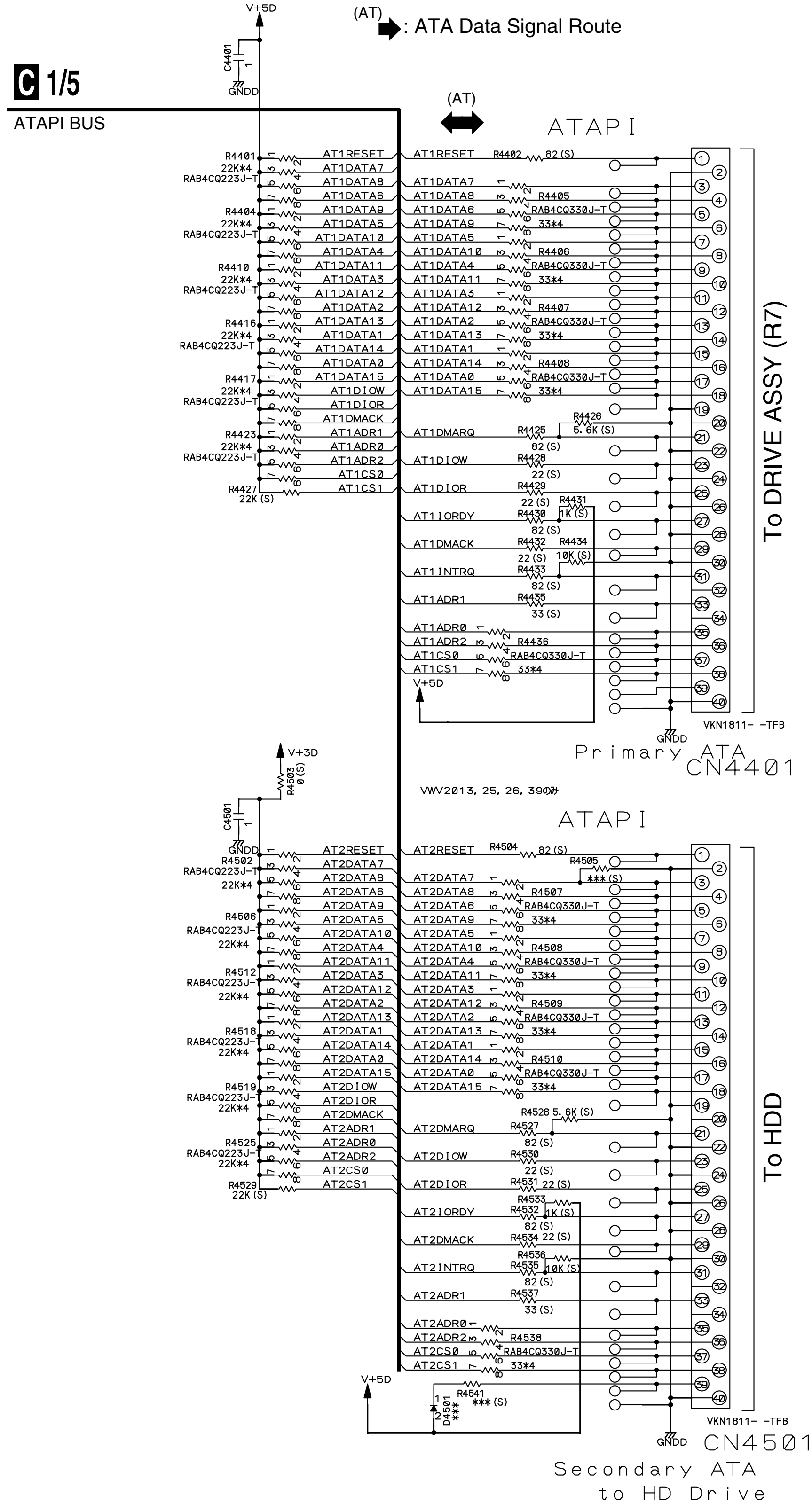


3.9 MAIN ASSY(4/5)



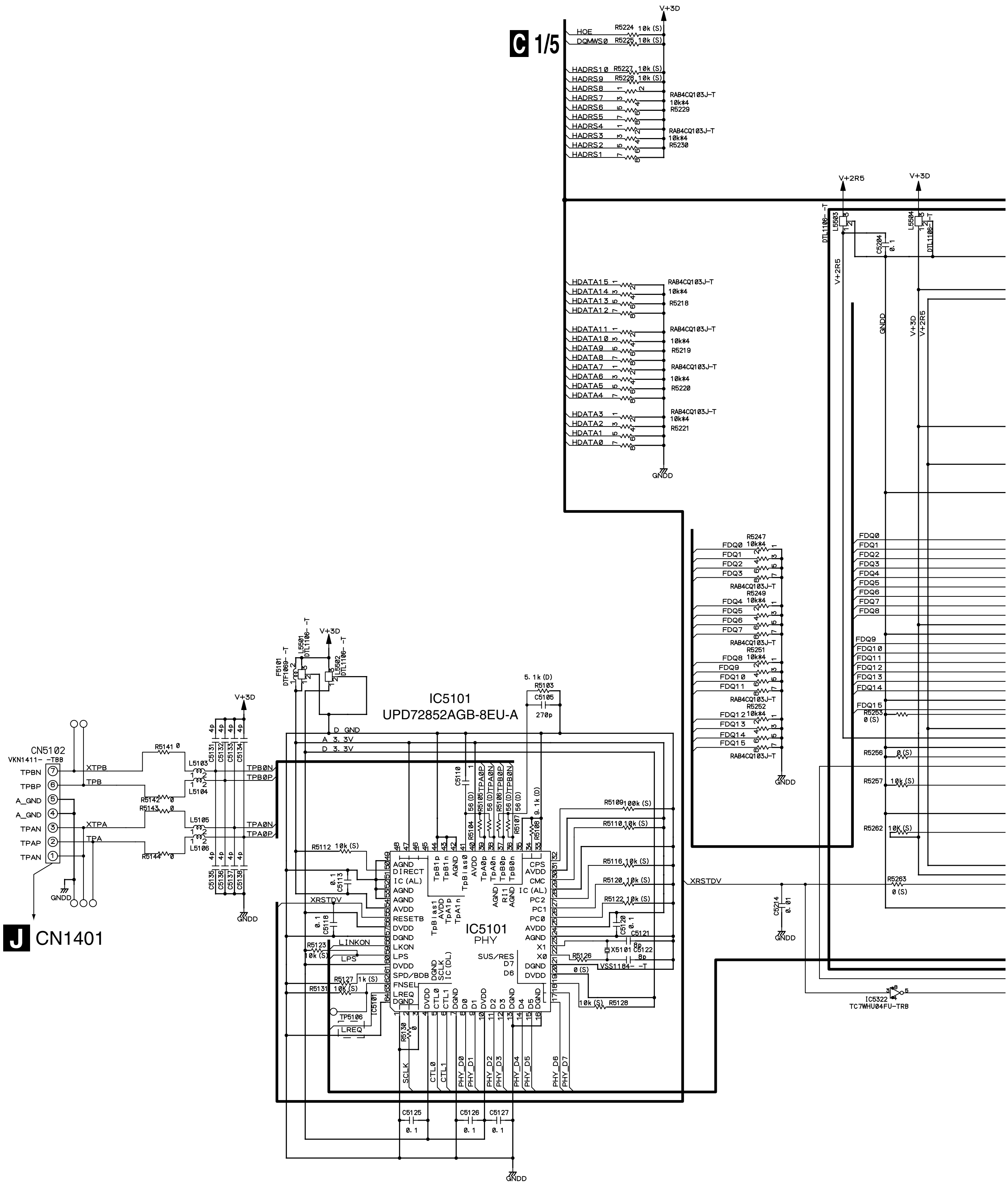
C 4/5 MAIN ASSY (VWV2025)

C 4/5

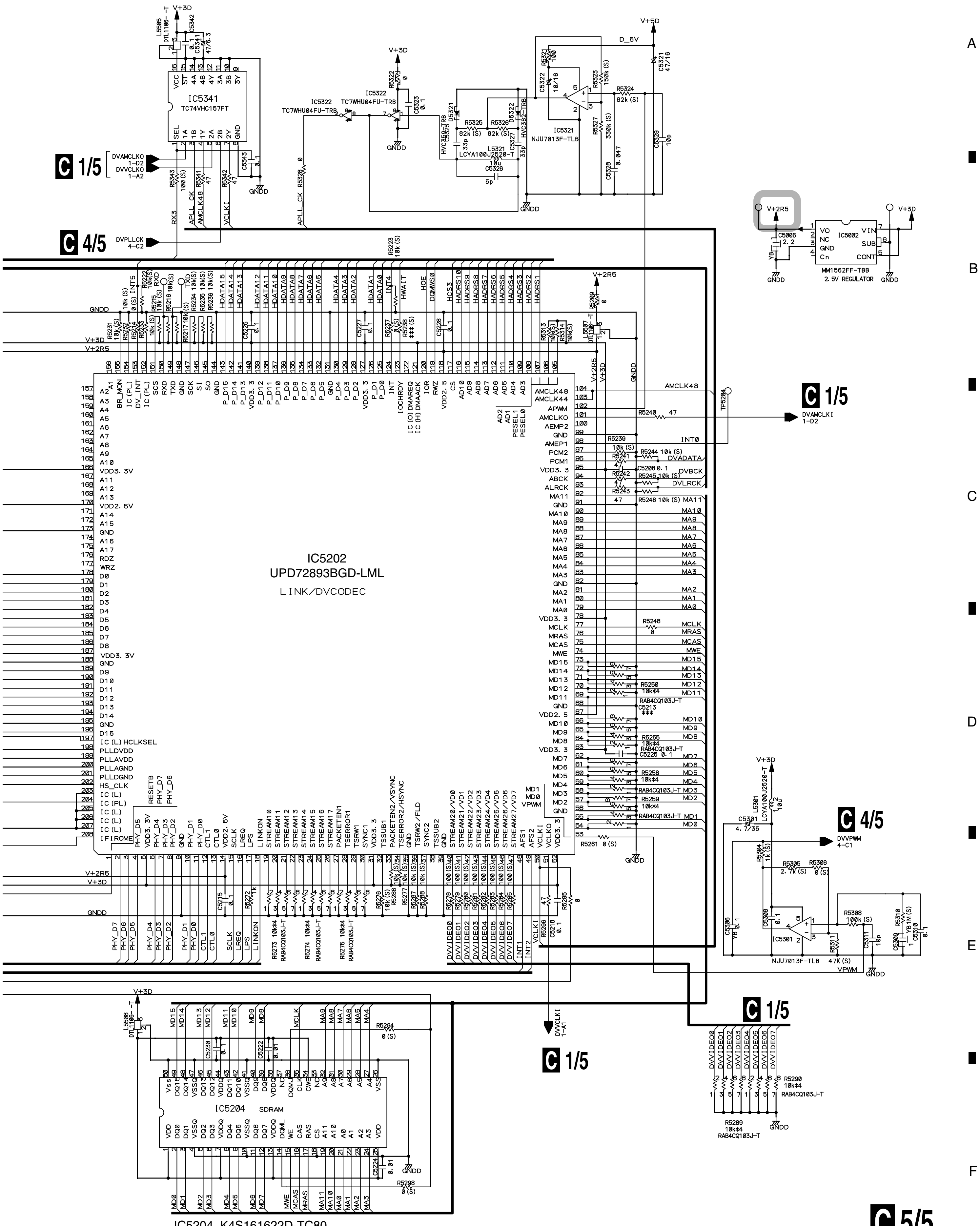

(AT) : ATA Data Signal Route
C 1/5
ATAPI BUS
V+5D
C4401
GNDD
(AT)
ATAPI
To DRIVE ASSY (R7)
Primary ATA
CN4401
VKN1811- -TFB
V+3D
R4503
C4501
VWV2013, 25, 26, 39のみ
ATAPI
To HDD
CN4501
Secondary ATA
to HD Drive
D4501
R4541

3.10 MAIN ASSY(5/5)

C 5/5 MAIN ASSY (VWV2025)

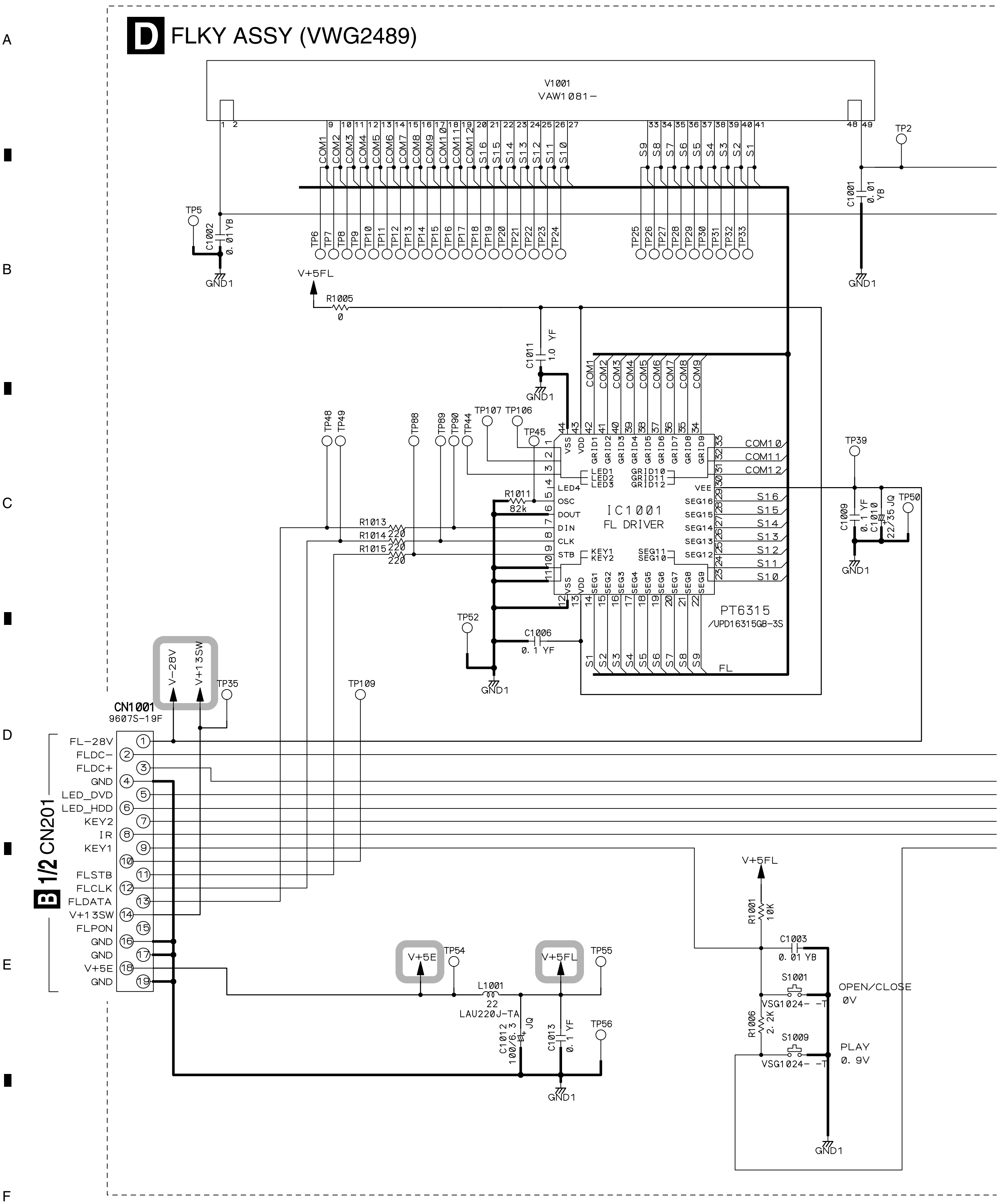


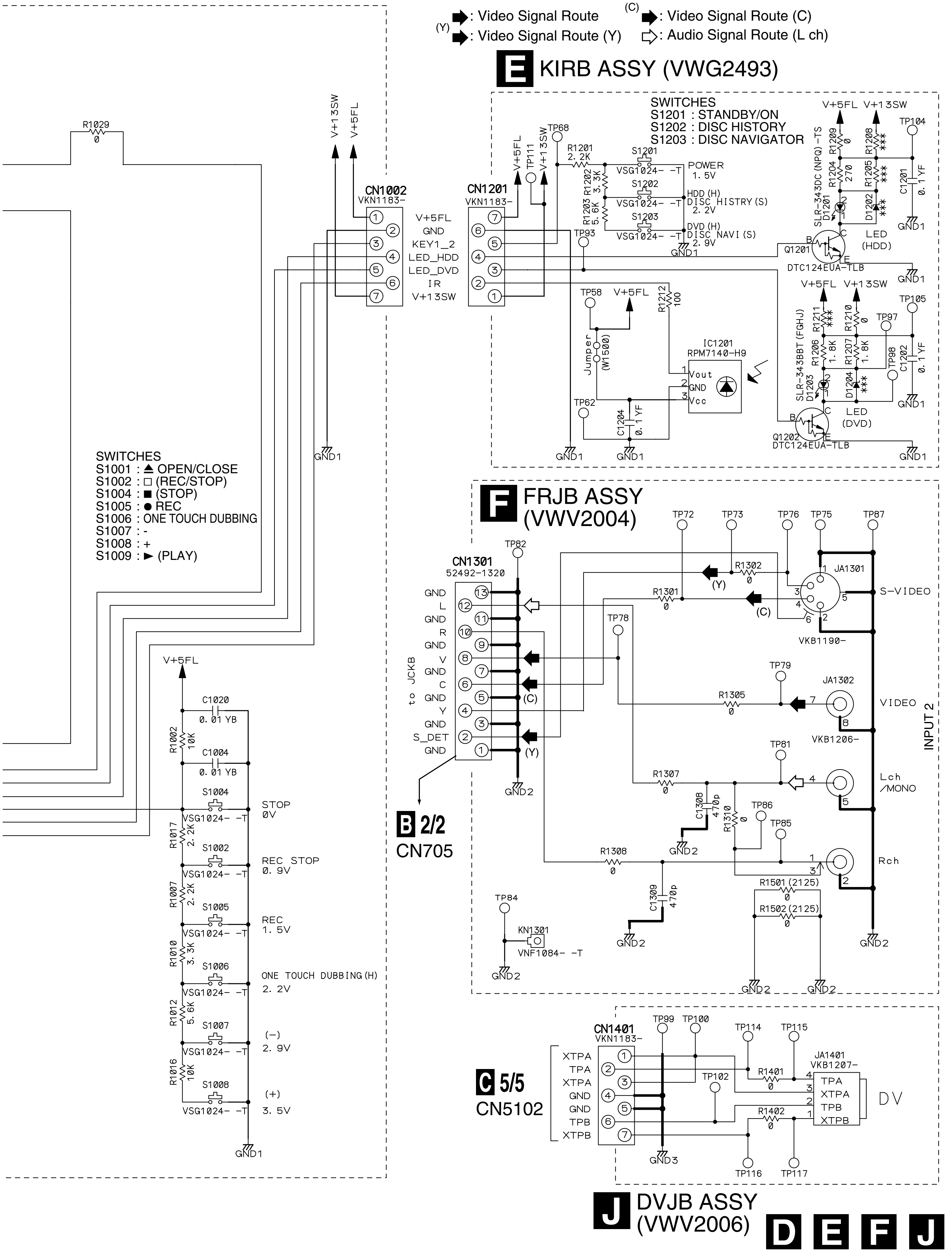
C 5/5


IC5341
TC74VHC157FT
IC5322
TC7WHU04FU-TRB
IC5321
NJU7013F-TLB
IC5002
MM1562FF-TBB
2.5V REGULATOR
C 1/5
DVAMCLKO 1-D2
DVVCLKO 1-A2
C 4/5
DVPLLCK 4-C2
IC5202
UPD72893BGD-LML
LINK/DVCODEC
DVAMCLKI 1-D2
DVVPWM 4-C1
IC5301
NJU7013F-TLB
DVVCLKI 1-A1
IC5204 SDRAM
R5290 10k*4 RAB4CQ103J-T
R5289 10k*4 RAB4CQ103J-T
IC5204 K4S161622D-TC80

C 5/5

3.11 FLKY, KIRB, FRJB and DVJB ASSYS

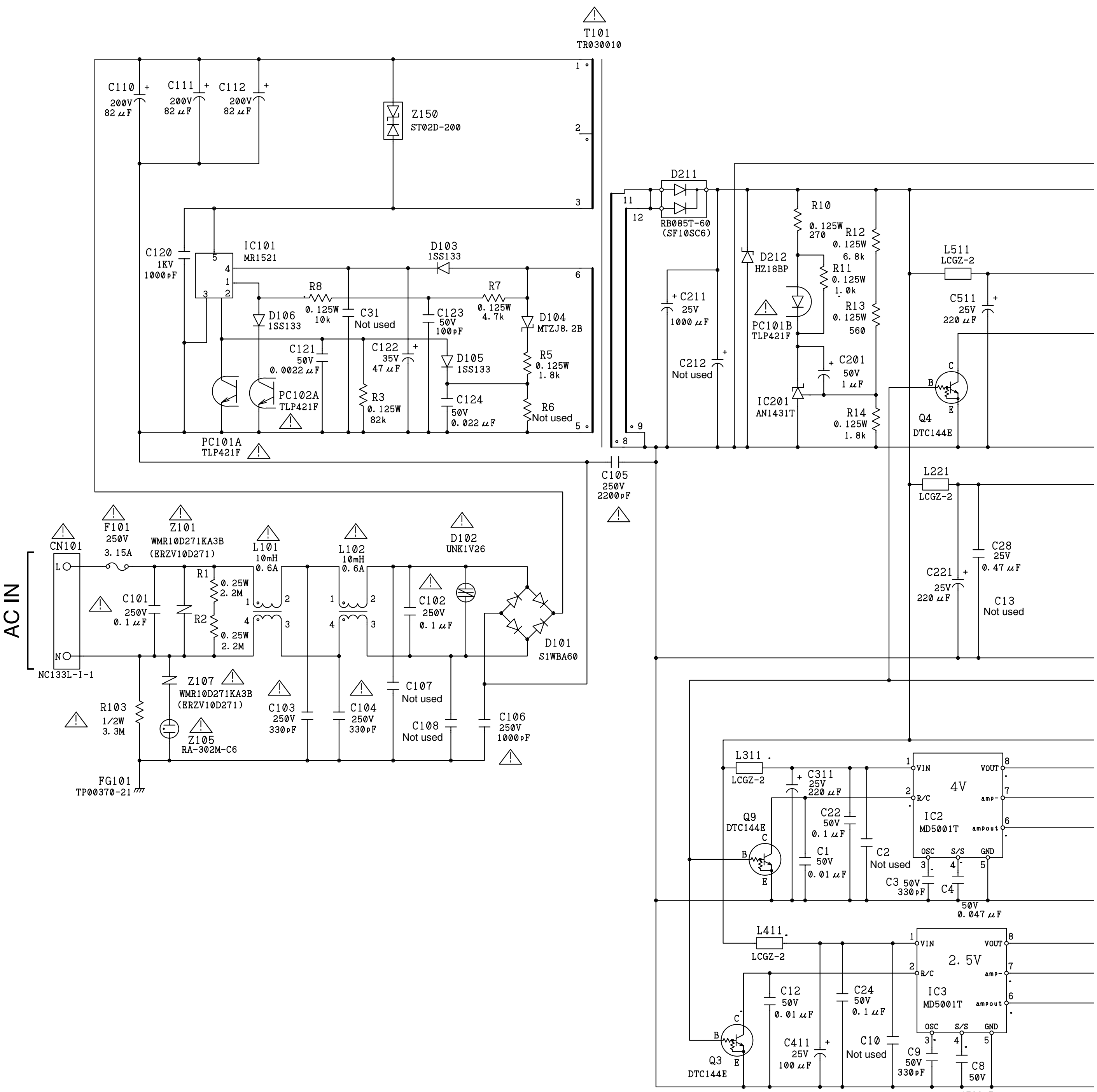




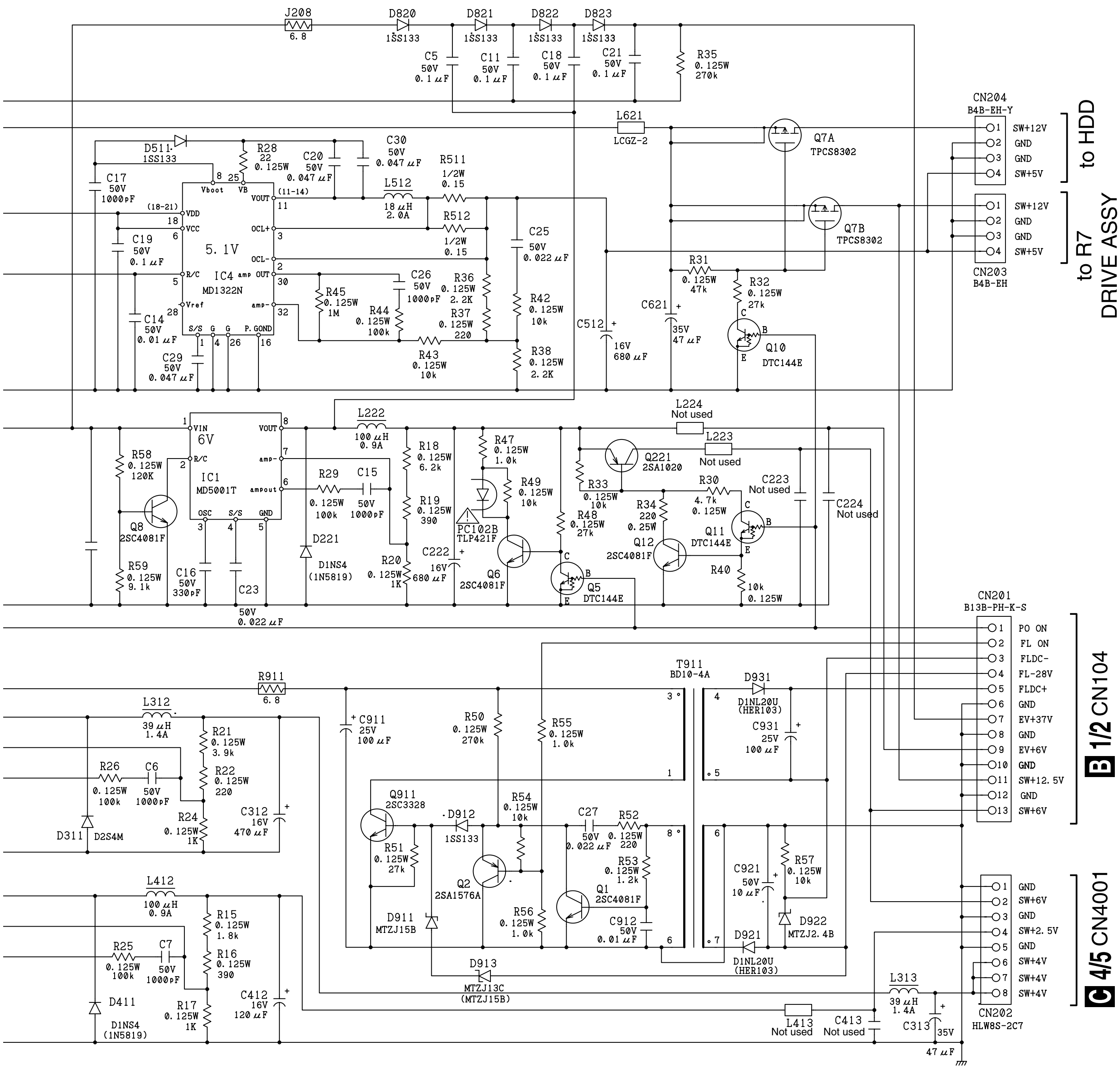
: Video Signal Route
(Y) : Video Signal Route (Y)
(C) : Video Signal Route (C)
: Audio Signal Route (L ch)
E KIRB ASSY (VWG2493)
SWITCHES
S1201 : STANDBY/ON
S1202 : DISC HISTORY
S1203 : DISC NAVIGATOR
POWER 1.5V
HDD (H) DISC HISTRY (S) 2.2V
DVD (H) DISC NAVI (S) 2.9V
CN1201 VKN1183-
CN1002 VKN1183-
V+5FL
GND
KEY1_2
LED_HDD
LED_DVD
IR
V+13SW
IC1201 RPM7140-H9
Vout
GND
Vcc
Jumper (W1500)
LED (HDD)
LED (DVD)
Q1201 DTC124EUA-TLB
Q1202 DTC124EUA-TLB
SLR-343DC (NPQ) -TS
SLR-343BBT (FGHJ)
SWITCHES
S1001 : ≜ OPEN/CLOSE
S1002 : □ (REC/STOP)
S1004 : ■ (STOP)
S1005 : ● REC
S1006 : ONE TOUCH DUBBING
S1007 : -
S1008 : +
S1009 : ► (PLAY)
STOP 0V
REC STOP 0.9V
REC 1.5V
ONE TOUCH DUBBING (H) 2.2V
(−) 2.9V
(+) 3.5V
F FRJB ASSY (VWV2004)
CN1301 52492-1320
GND
L
GND
R
GND
V
GND
C
GND
Y
GND
S_DET
GND
to JCKB
B 2/2 CN705
JA1301 VKB1190-
S-VIDEO
JA1302 VKB1206-
VIDEO
Lch /MONO
Rch
INPUT 2
KN1301 VNF1084- -T
C 5/5 CN5102
CN1401 VKN1183-
XTPA
TPA
XTPA
GND
GND
TPB
XTPB
JA1401 VKB1207-
TPA
XTPA
TPB
XTPB
DV
J DVJB ASSY (VWV2006)
D E F J

3.12 POWER SUPPLY UNIT

POWER SUPPLY UNIT (VWR1380)



Note : No individual parts replacement for repair is accepted by Model Supplier due to the safety reasons.
Replace whole ASSY.



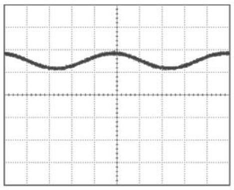
3.13 WAVE FORMS

Note : The encircled numbers denote measuring point in the schematic diagram.

A

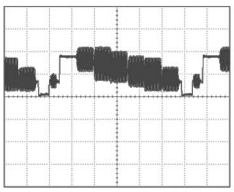
B JCKB ASSY

① IC601-pin 11 (L4)
(Function : Tuner 2 ch)
V: 1V/div. H: 200µsec/div.



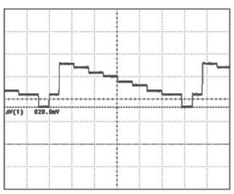
← GND

② CN401-pin 3 (UVIN)
(Function : Tuner 2 ch)
V: 500mV/div. H: 10µsec/div.



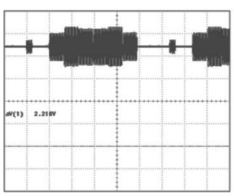
← GND

③ IC701-pin 27 (YSWO)
(Function : Line 1 Video in)
V: 500mV/div. H: 10µsec/div.



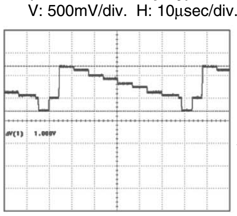
← GND

④ IC701-pin 25 (CSWO)
(Function : Line 1 Video in)
V: 500mV/div. H: 10µsec/div.



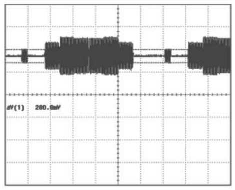
← GND

⑤ CN701-pin 29 (YVMtoT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



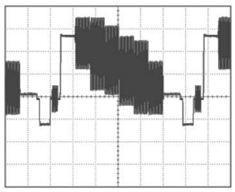
← GND

⑥ CN701-pin 27 (CMtoT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



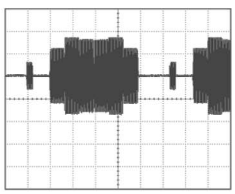
← GND

⑦ IC701-pin 69 (VOUT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



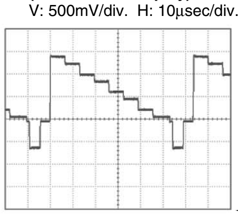
← GND

⑧ IC701-pin 65 (COUT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



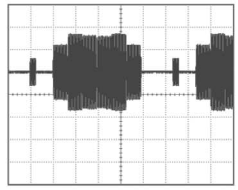
← GND

⑨ IC701-pin 63 (YOUT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



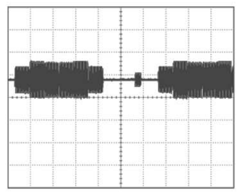
← GND

⑩ JA702-pin 4 (COUT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



← GND

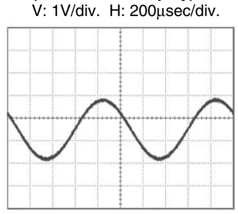
(Not terminated)



← GND

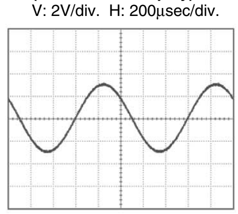
(75Ω terminated)

⑪ CN701-pin 5 (ALTtoM)
(Function : DVD play)
V: 1V/div. H: 200µsec/div.



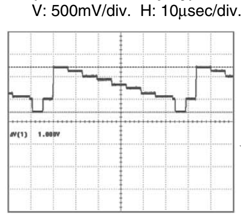
← GND

⑫ CN701-pin 17 (ALMtoT)
(Function : DVD play)
V: 2V/div. H: 200µsec/div.



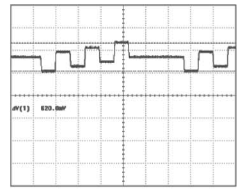
← GND

⑬ CN701-pin 25 (YGMtoT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



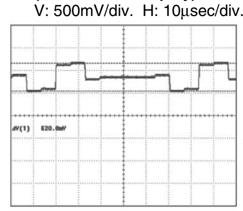
← GND

⑭ CN701-pin 23 (CBBMtoT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



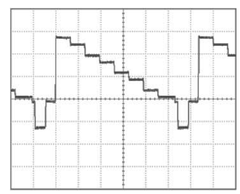
← GND

⑮ CN701-pin 21 (CRRMtoT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



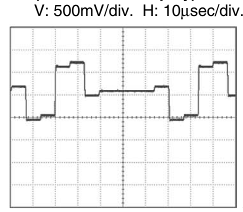
← GND

⑯ IC701-pin 60 (PYRSCOUT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



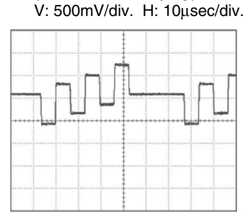
← GND

⑰ IC701-pin 58 (CRGOUT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.



← GND

⑱ IC701-pin 56 (CBBOUT)
(Function : DVD play)
V: 500mV/div. H: 10µsec/div.

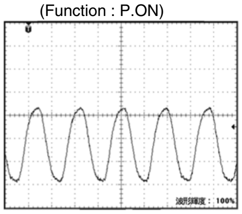


← GND

C MAIN ASSY

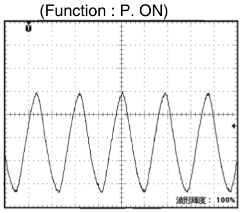
Measurement condition ;
No.3 to No.8, No.10 to No.13 : 75% Color-bar, A1 disc 2-20
No.15 ,No.16 : 75% Color-bar
No.9, No.14 : 1kHz, 2Vrms, A1 disc 2-1
No.17 : 1kHz, 2Vrms

1 X4102 - pin 4 (ADMCLKI)
V: 1V/div. H: 20nsec/div.
(Function : P.ON)



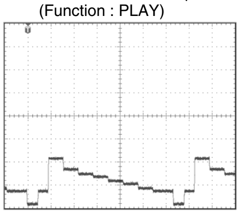
← GND

2 R4205 (VMCLK)
V: 1V/div. H: 20nsec/div.
(Function : P. ON)



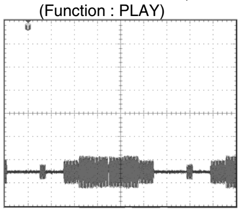
← GND

3 Q2103 - B (Y)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



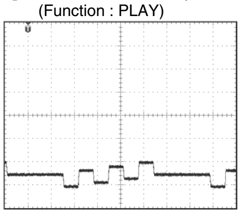
← GND

4 Q2102 - B (C)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



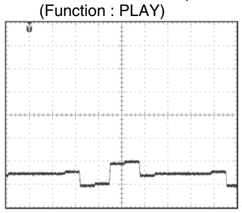
← GND

5 Q2104 - B (Cb)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



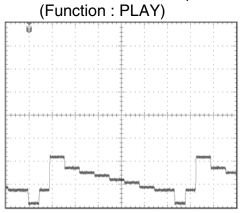
← GND

6 Q2105 - B (Cr)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



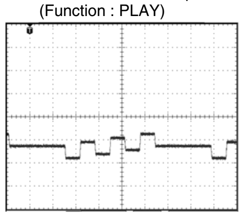
← GND

7 Q2101 - B (Y)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



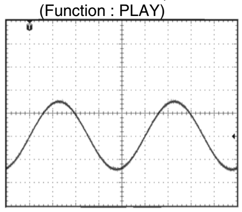
← GND

8 CN2001-pin 23 (Cb Out)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



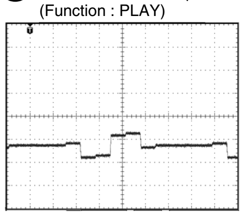
← GND

9 CN2001-pin 17 (Lch Out)
V: 2V/div. H: 200µsec/div.
(Function : PLAY)



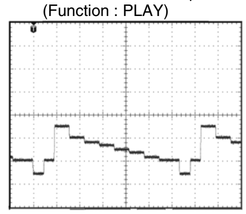
← GND

10 CN2001-pin 21 (Cr Out)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



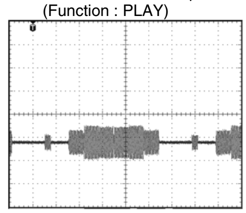
← GND

11 CN2001-pin 29 (Y Out)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



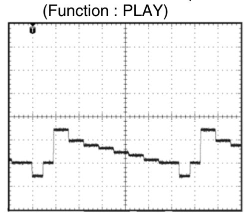
← GND

12 CN2001-pin 27 (C Out)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



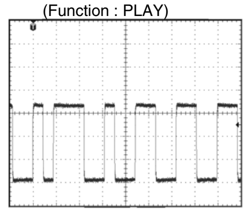
← GND

13 CN2001-pin 25 (Y Out)
V: 500mV/div. H: 10µsec/div.
(Function : PLAY)



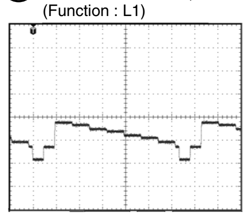
← GND

14 CN3001-pin 13 (PCMAIN)
V: 1V/div. H: 400nsec/div.
(Function : PLAY)



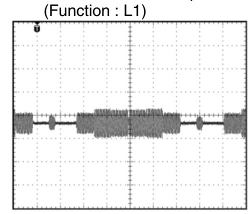
← GND

15 CN2001-pin 9 (SEL Y/V)
V: 500mV/div. H: 10µsec/div.
(Function : L1)



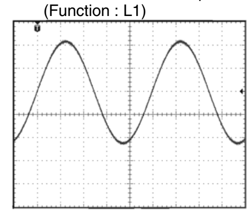
← GND

16 CN2001-pin 7 (SEL C)
V: 500mV/div. H: 10µsec/div.
(Function : L1)



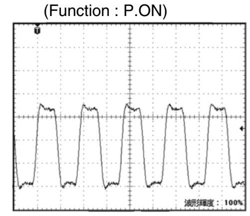
← GND

17 CN2001-pin 5 (SEL L)
V: 500mV/div. H: 200µsec/div.
(Function : L1)



← GND

18 IC3402-pin 7 (27MCLK)
V: 1V/div. H: 20nsec/div.
(Function : P.ON)



← GND

A

B

C

D

E

F

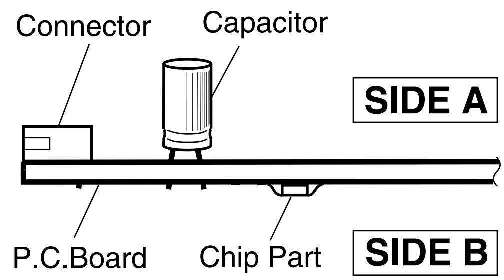
4. PCB CONNECTION DIAGRAM

NOTE FOR PCB DIAGRAMS :

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destinations.
   For further information for respective destinations, be sure to check with the schematic diagram.
4. View point of PCB diagrams.

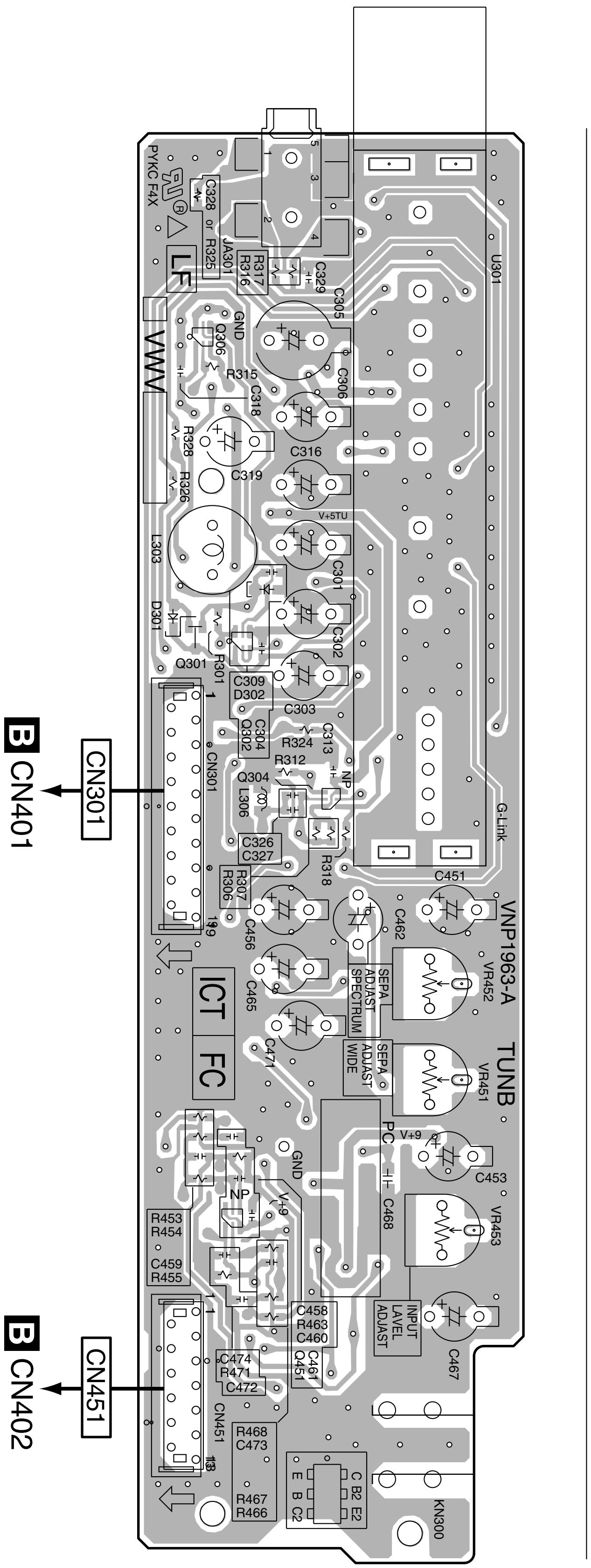


4.1 TUNB ASSY

SIDE A **SIDE A**

A

A TUNB ASSY



(VNP1963-A)

B

C

D

E

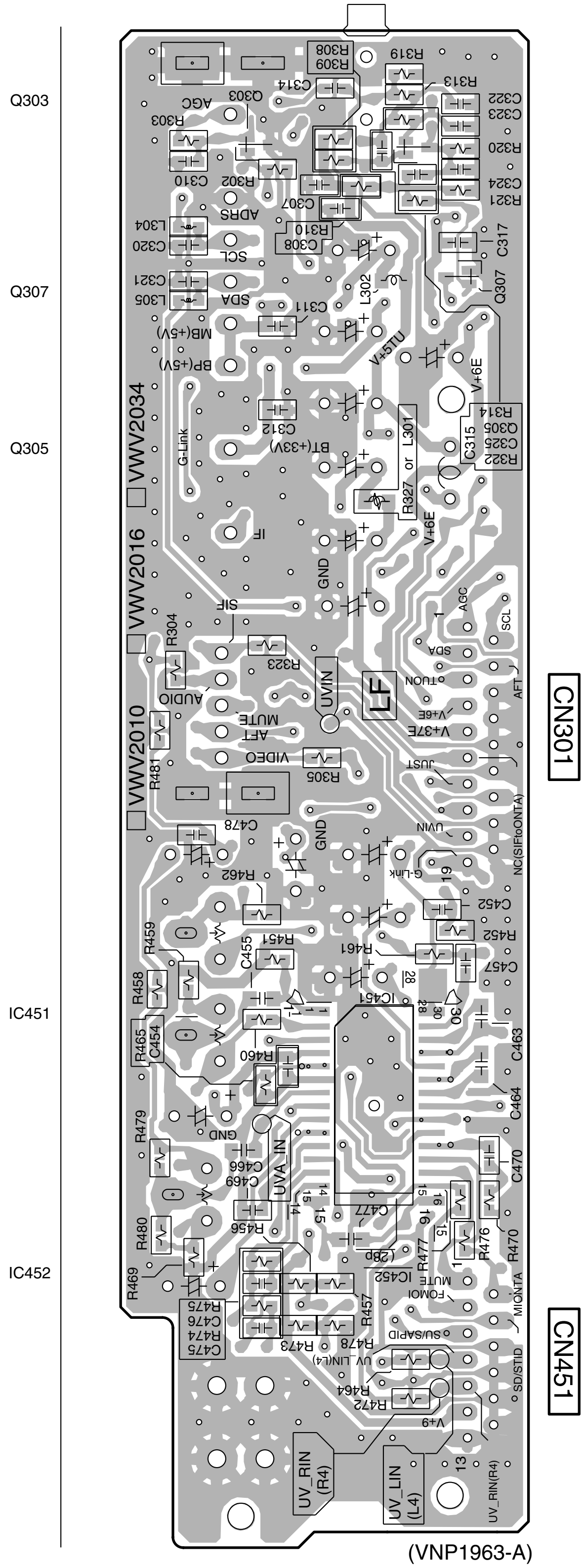
F

A A

SIDE B

SIDE B

A TUNB ASSY

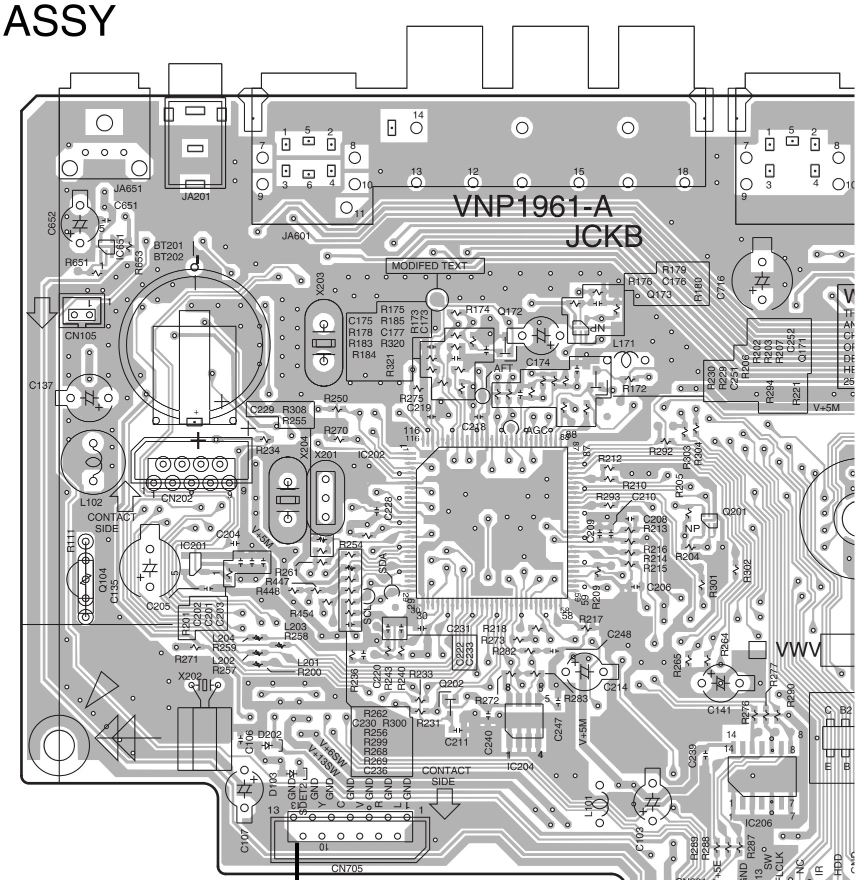


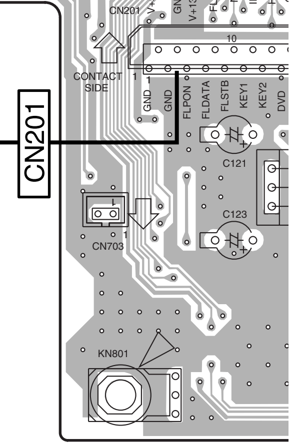
4.2 JCKB, ATWB and ATHB ASSYS

SIDE A

IC651 Q708
Q711
Q173
Q172
IC701 Q171
IC202
Q702
Q201
Q712
IC201 Q703
Q104
IC501
Q514
Q202
IC204
Q101
IC206 Q406
Q771
Q405
Q407
Q404
IC103
IC401

B JCKB ASSY



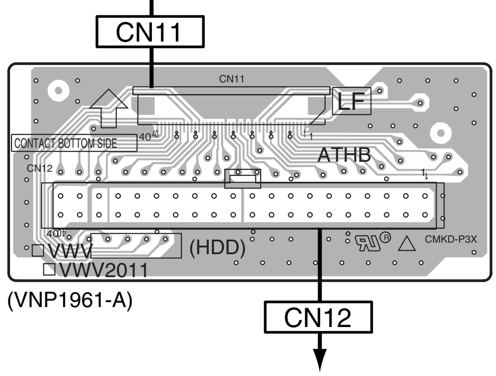


F CN1301

D CN1001

H ATHB ASSY

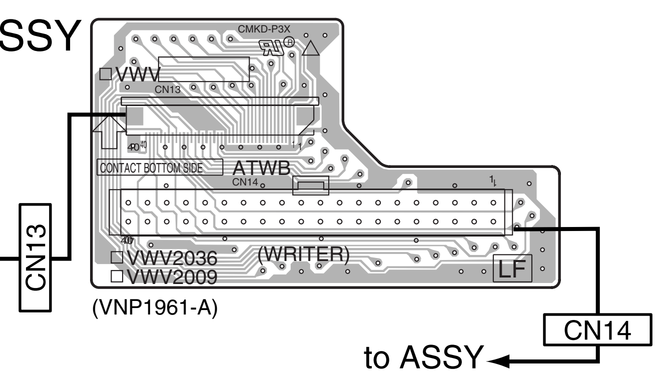
C CN4501



(VNP1961-A)

to HDD

G ATWB ASSY



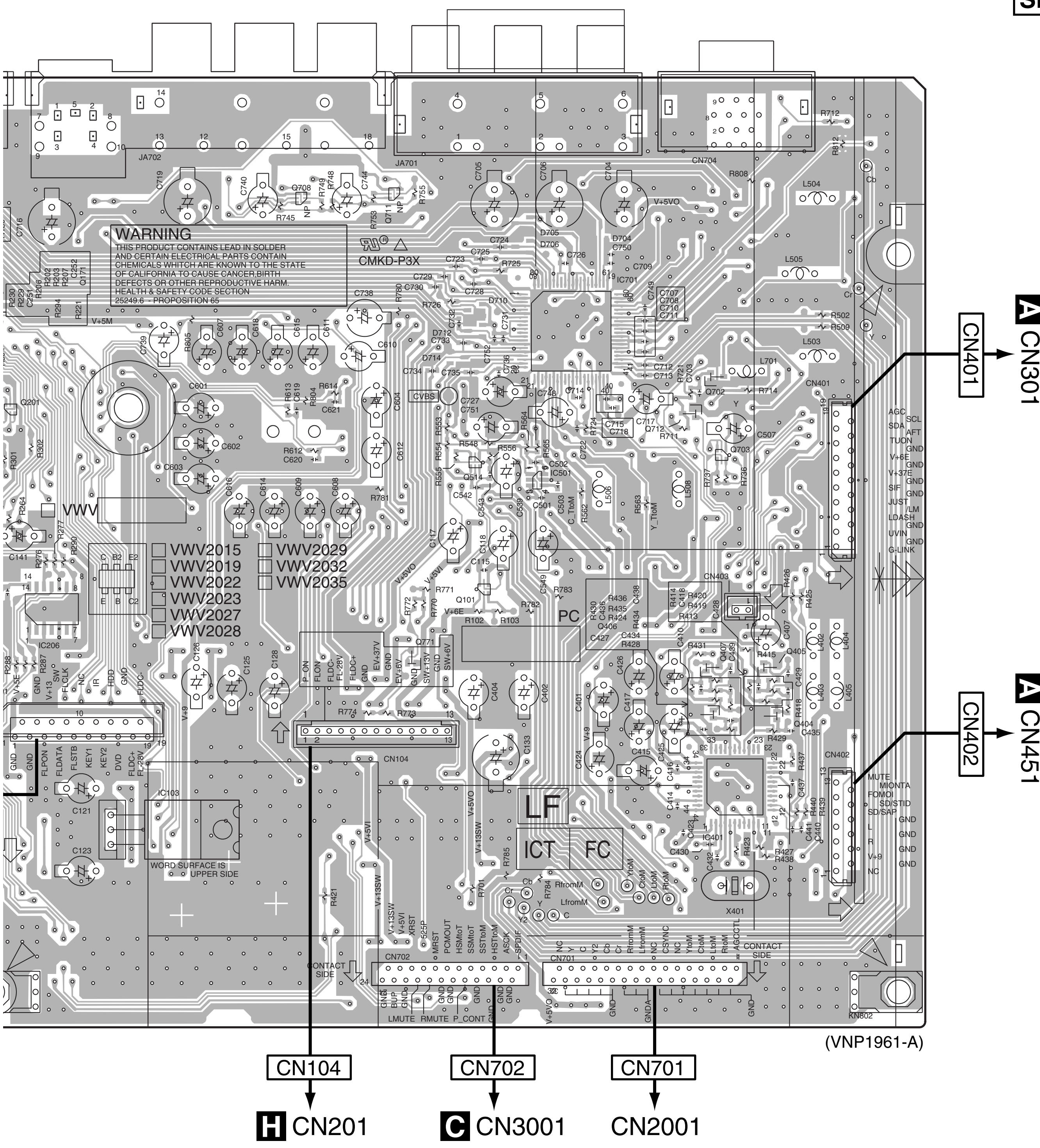
C CN4401

(VNP1961-A)

to ASSY

B G H

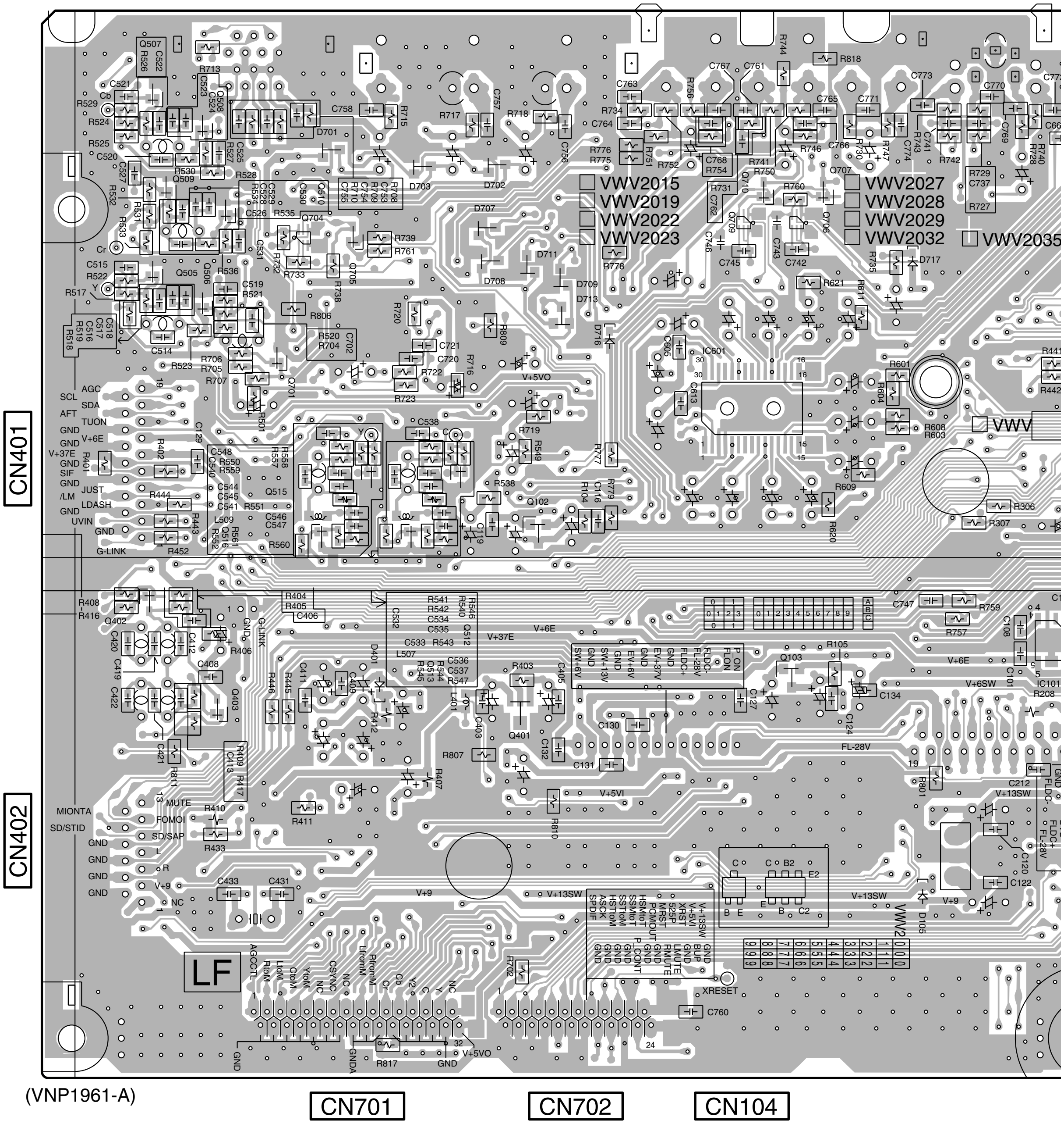
SIDE A



A B C D E F

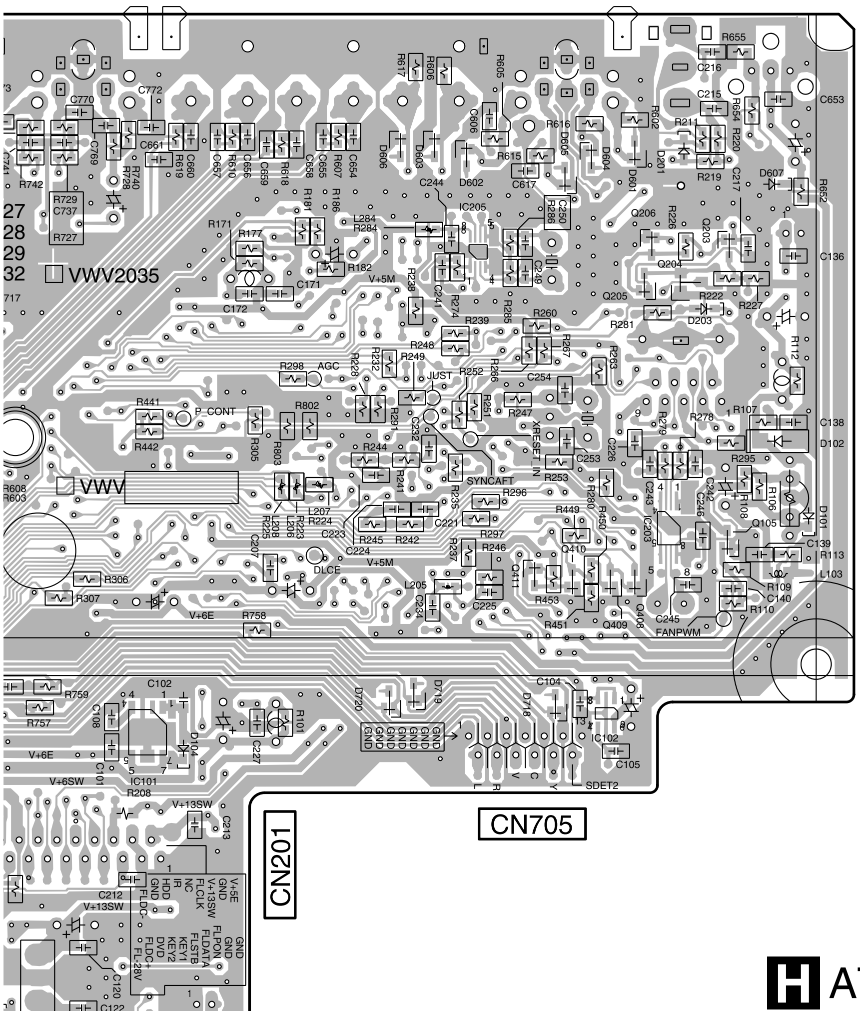
SIDE B

B JCKB ASSY



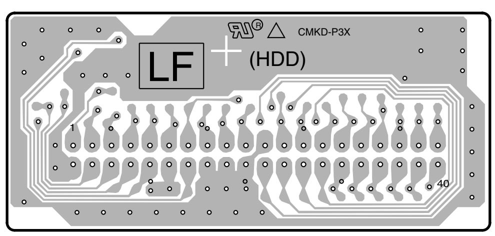
(VNP1961-A)

SIDE B



	Q507
	Q508
IC205	Q710 Q707 Q509 Q510 Q206 Q203 Q709 Q706 Q704 Q204 Q506 Q705 Q205 Q505
IC601	
	Q701
	Q105
IC203	Q410 Q515 Q102 Q411
	Q516 Q408
	Q409
	Q402 Q512
IC102	Q513 Q103
IC101	Q403
	Q401

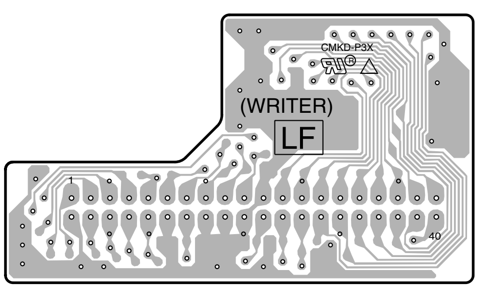
H ATHB ASSY



(VNP1961-A)

CN12

G ATWB ASSY



CN14

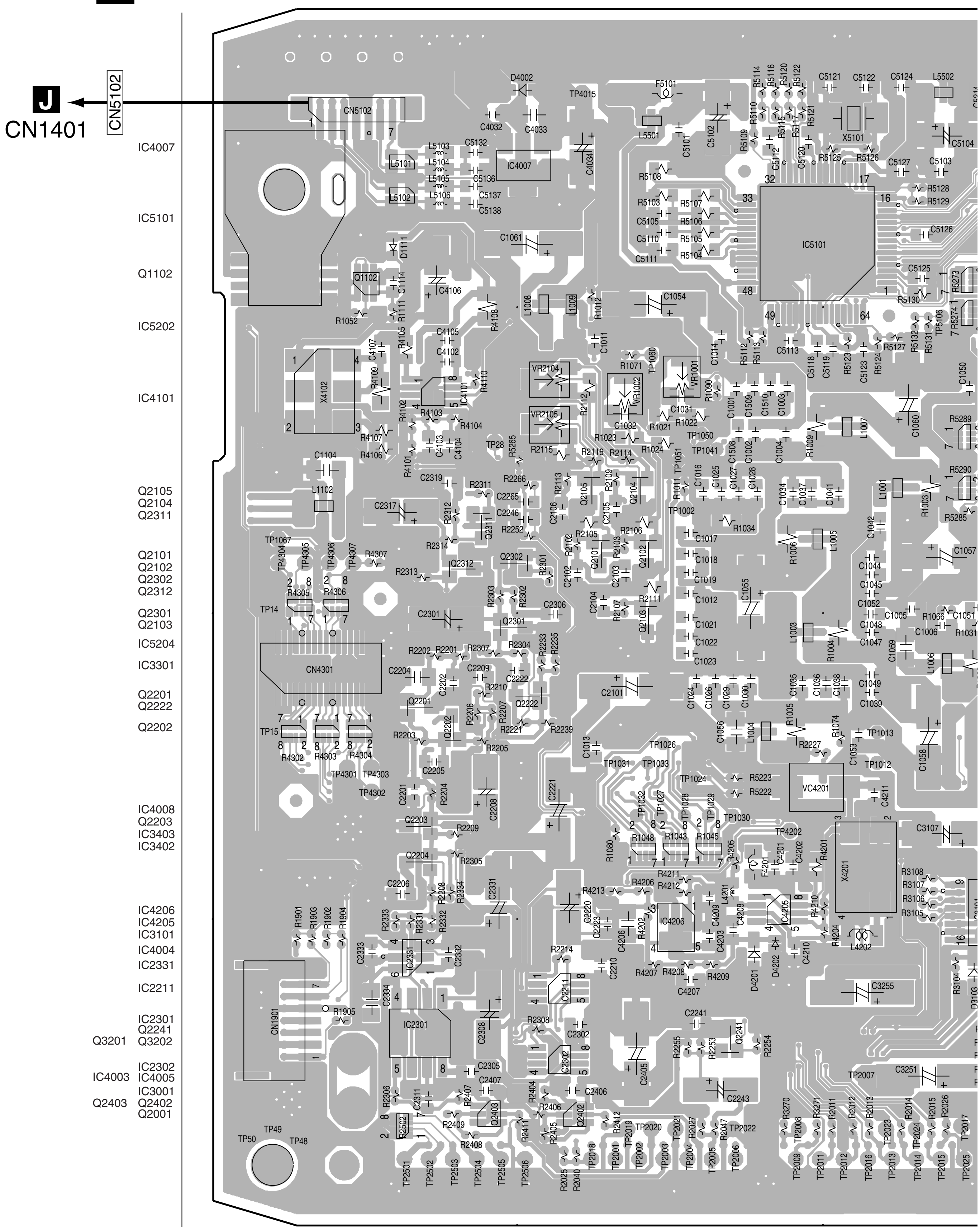
(VNP1961-A)

B G H

4.3 MAIN ASSY

SIDE A

C MAIN ASSY

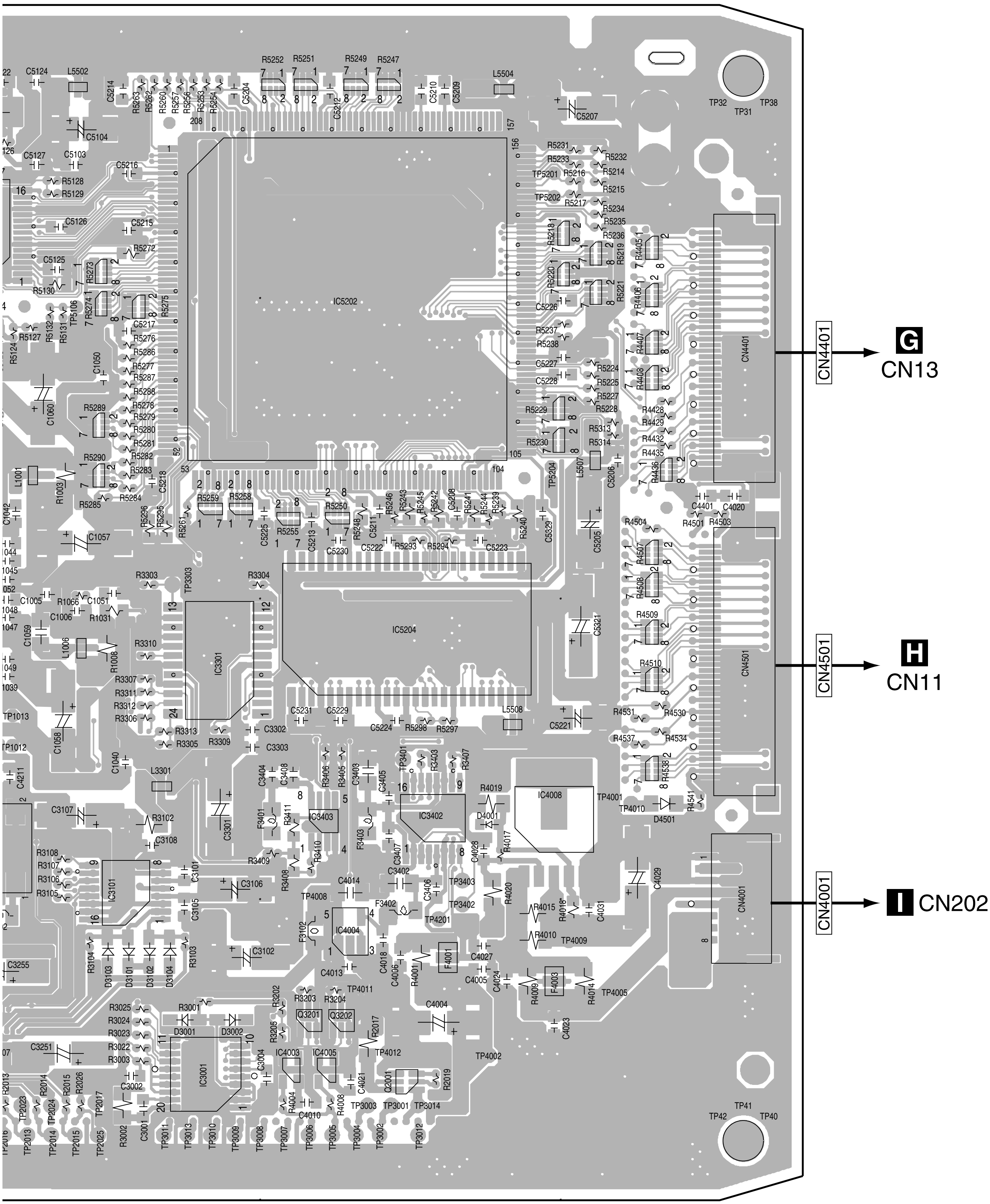


C

SIDE A

A

This PCB is six layer structure.



B

C

D

E

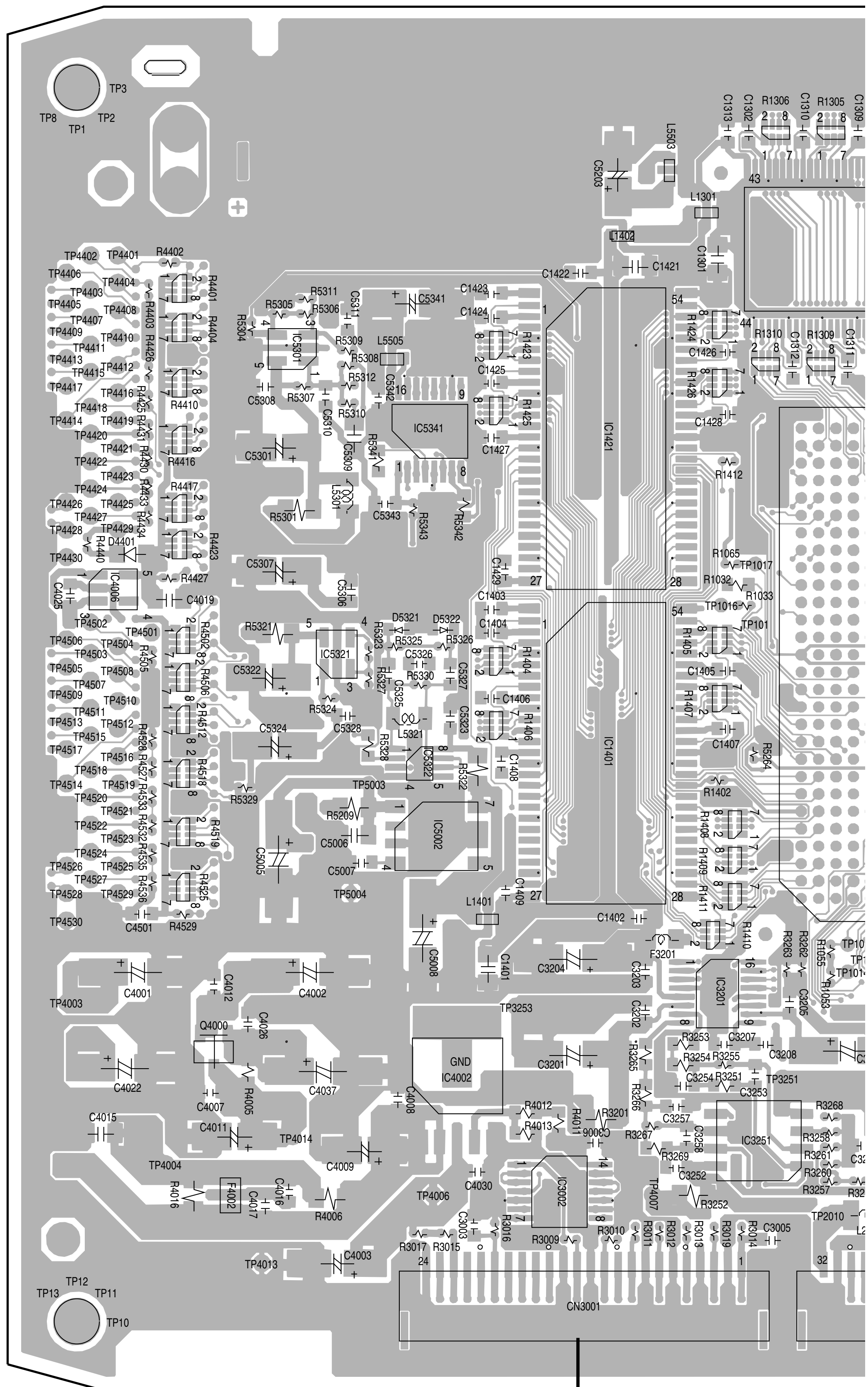
F

(VNP1960-C)

SIDE B

C MAIN ASSY

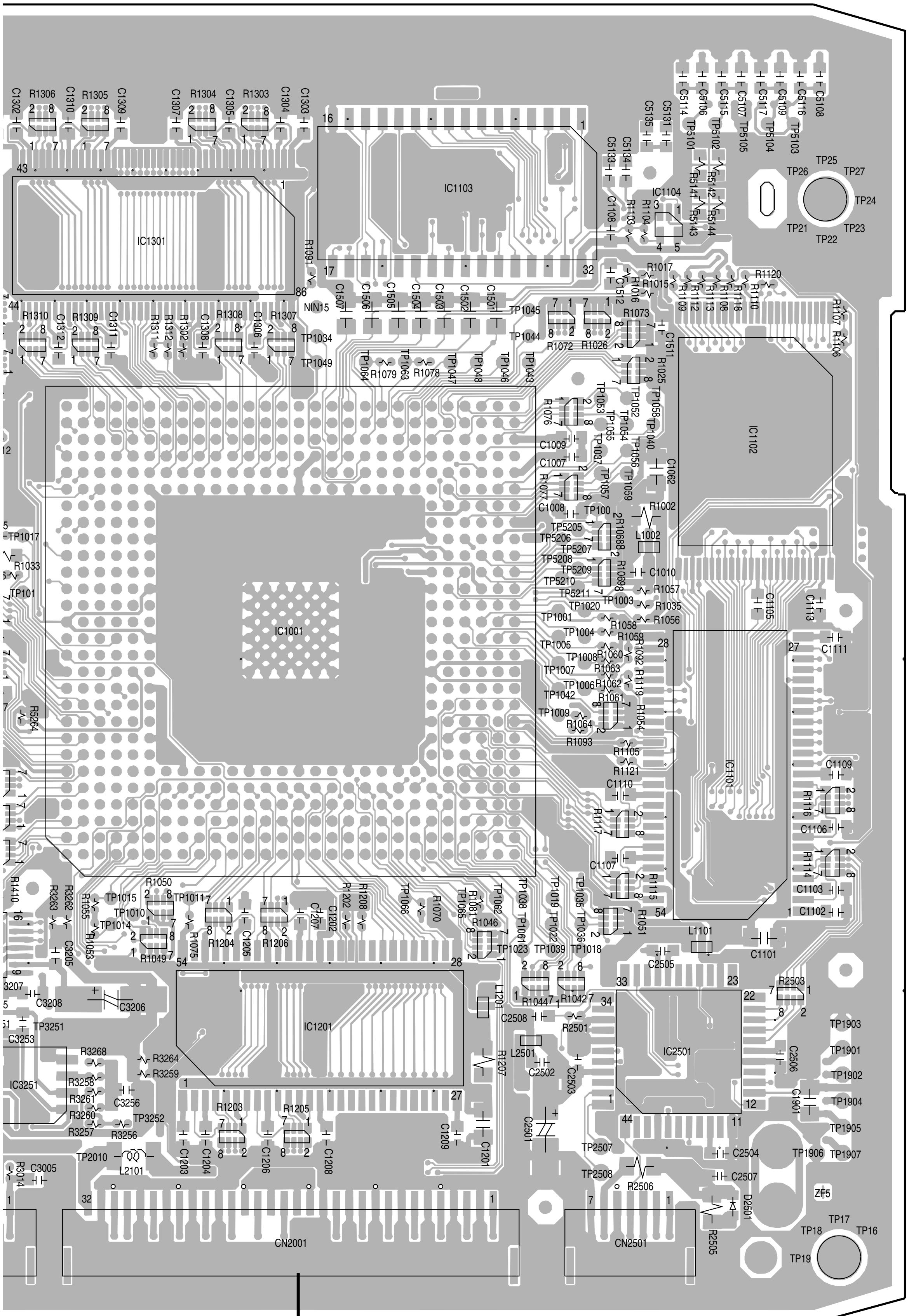
IC1103
IC1104
IC1301
IC5301
IC5341
IC1421
IC1102
IC4006
IC5321
IC1001
IC5322
IC1401
IC5002
IC1101
IC3201
Q4000
IC4002
IC1201
IC2501
IC3251
IC3002



SIDE B

A

This PCB is six layer structure.



B

C

D

E

F

CN2001

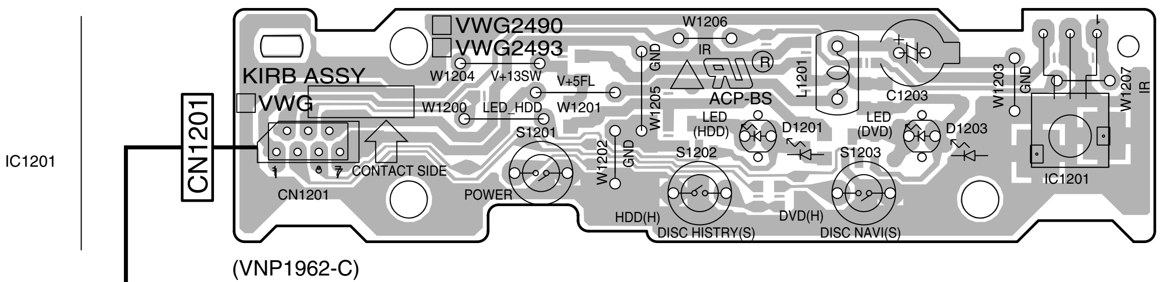
B CN701

(VNP1960-C)

4.4 FLKY, KIRB, FRJB and DVJB ASSYS

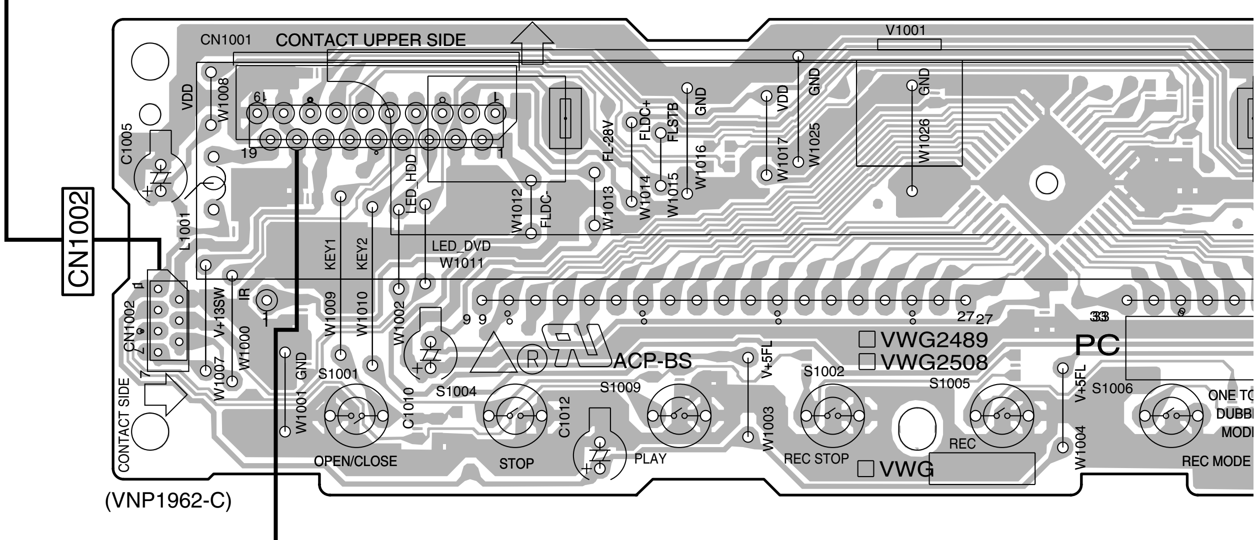
SIDE A

E KIRB ASSY



(VNP1962-C)

D FLKY ASSY



(VNP1962-C)

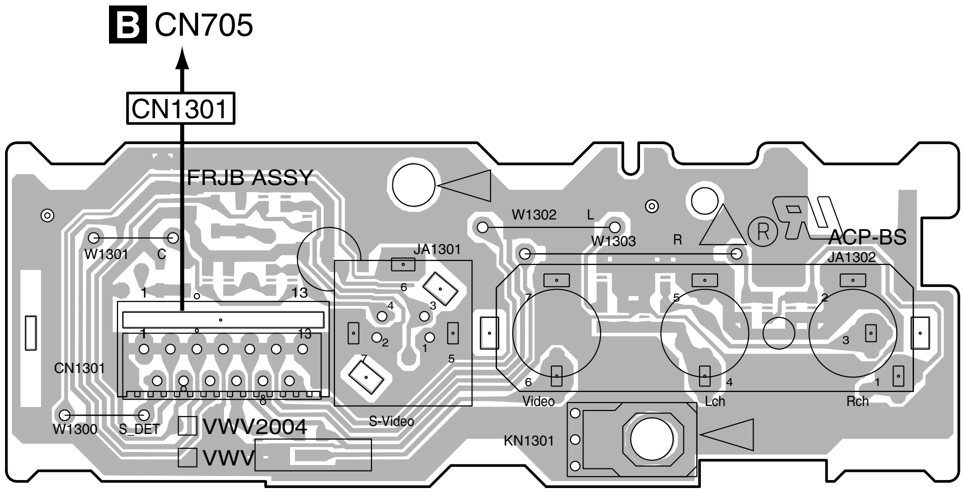
CN1001

B CN201

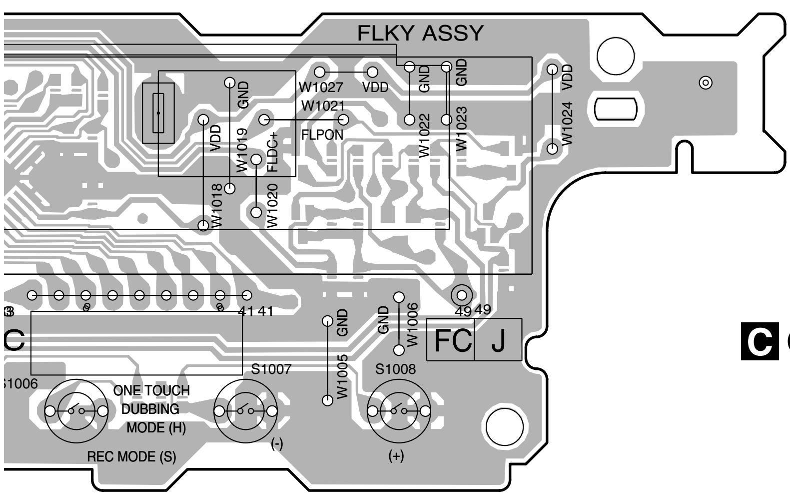
D E

SIDE A

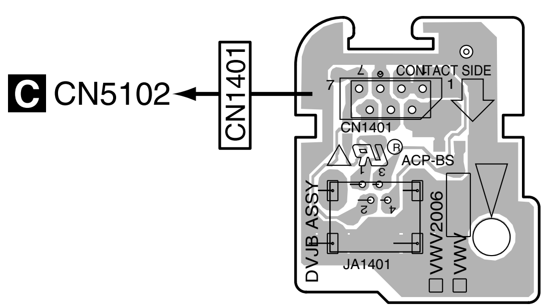
F FRJB ASSY



(VNP1962-C)



J DVJB ASSY



(VNP1962-C)

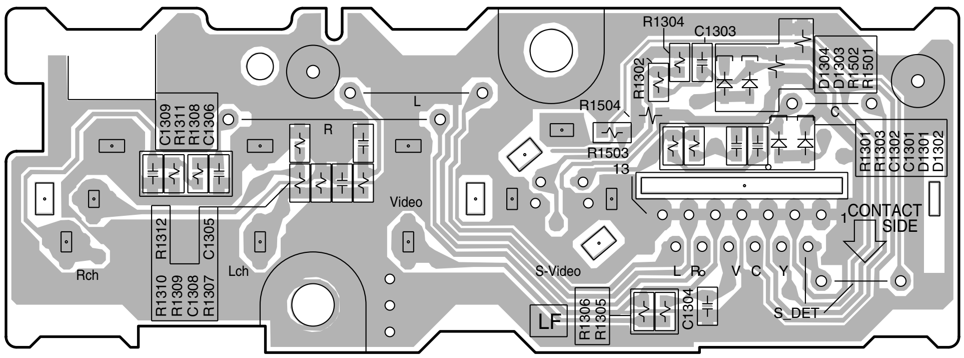
D F J

SIDE B

A

B

F FRJB ASSY

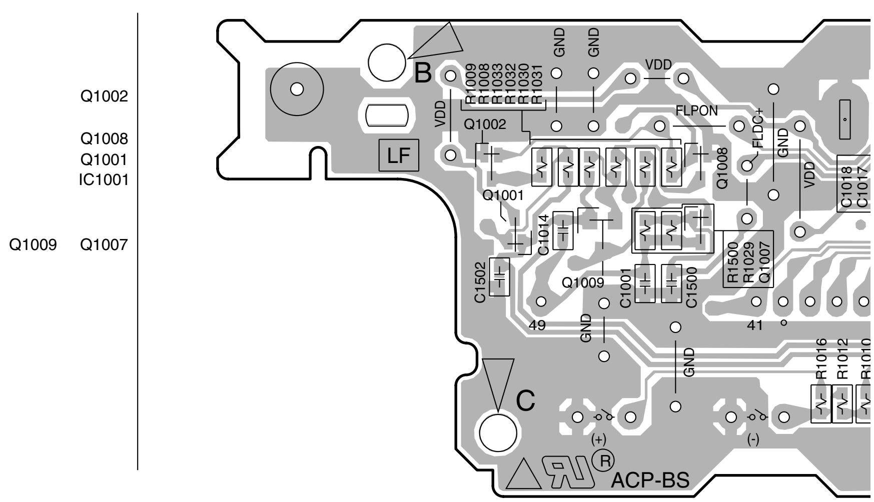


CN1301

(VNP1962-C)

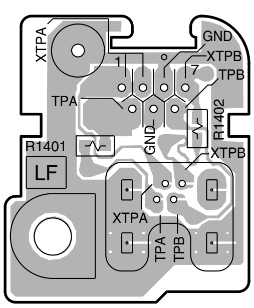
C

D FLKY ASSY



D

J DVJB ASSY



CN1401

(VNP1962-C)

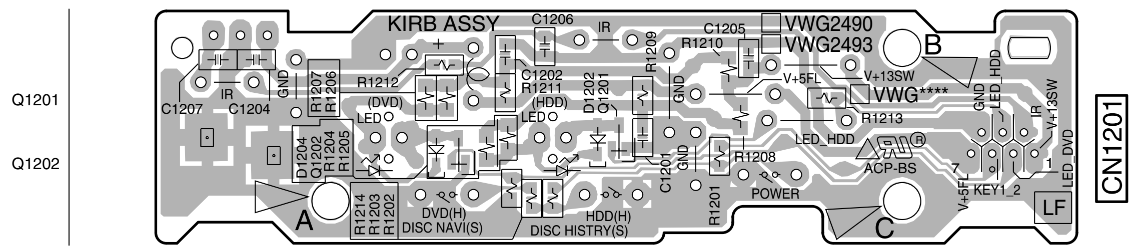
E

F

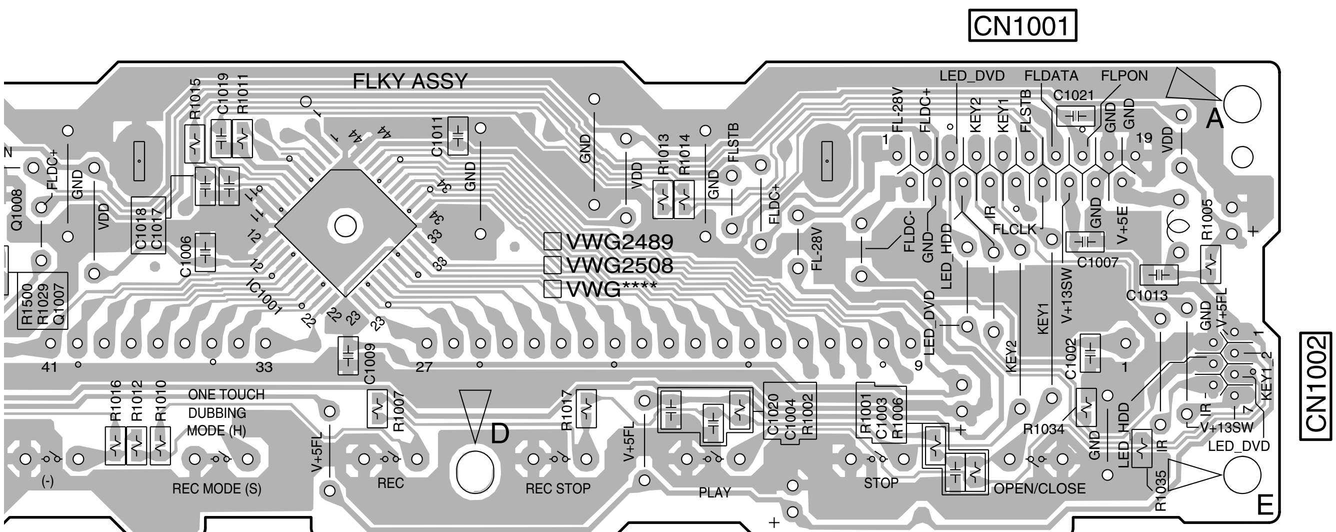
D F J

SIDE B

E KIRB ASSY



(VNP1962-C)



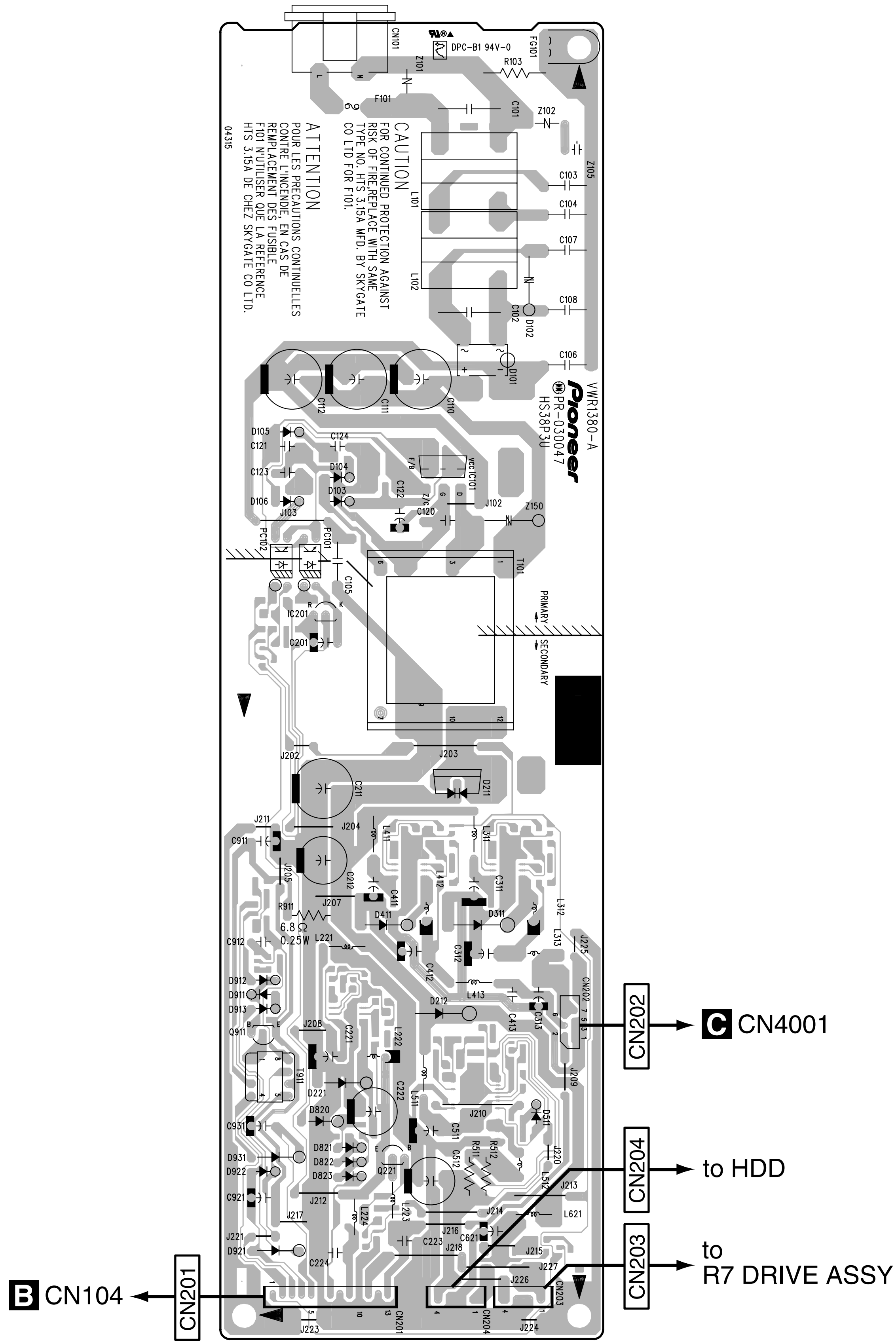
(VNP1962-C)

4.5 POWER SUPPLY UNIT

SIDE A

I POWER SUPPLY UNIT

SIDE A



5. PCB PARTS LIST

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω → 56 x 10^1 → 561 .... RD1/4PU 5 6 1 J
47k Ω → 47 x 10^3 → 473 .... RD1/4PU 4 7 3 J
0.5 Ω → R50 .... RN2H R 5 0 K
1 Ω → 1R0 .... RS1P 1 R 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 x 10^1 → 5621 .... RN1/4PC 5 6 2 1 F

Mark	No. Description	Part No.
NSP	1..FLKB ASSY	VWM2258
	2..FLKY ASSY	VWG2489
	2..KIRB ASSY	VWG2493
	2..FRJB ASSY	VWV2004
	2..DVJB ASSY	VWV2006
NSP	1..JACB ASSY	VWM2265
	2..ATWB ASSY	VWV2009
	2..ATHB ASSY	VWV2011
	2..JCKB ASSY	VWV2023
	1..TUNB ASSY	VWV2010
	1..MAIN ASSY	VWV2025
⚠	1..POWER SUPPLY UNIT	VWR1380

A TUNB ASSY

SEMICONDUCTORS

Mark	No. Description	Part No.
	IC451	CXA2064M
	Q303	2SA1576A
	Q301	2SC4081
	Q304, Q451	HN1C01FU
	Q302	RN4903
	Q306	UMF21N
	D301	1SS355
	D302	UDZS33B

COILS AND FILTERS

Mark	No. Description	Part No.
	L302 INDUCTOR	CTF1399
	L304, L305 CHIP BEADS	VTL1081
	L303 RADIAL INDUCTOR	VTL1165

CAPACITORS

Mark	No. Description	Part No.
	C460, C474	CCSRCH681J50
	C301, C303, C451, C467	CEAT100M50
	C319	CEAT101M10
	C453	CEAT101M16
	C305	CEAT102M6R3
	C462	CEAT4R7M50
	C459, C473	CKSRYB103K50
	C469, C470	CKSRYB105K10
	C475	CKSRYB123K50
	C311	CKSRYB222K50
	C452	CKSRYB272K50
	C458, C472	CKSRYB472K50
	C457	CKSRYB473K25
	C476	CKSRYB562K50
	C313, C454, C461	CKSRYF104Z25
	C455, C463, C464, C466, C468	VCG1039
	C477 (4.4uF)	VCG1039
	C471 (10/50V)	VCH1224
	C465 (3.3/50V)	VCH1225

RESISTORS

Mark	No. Description	Part No.
	R327	RS1/10S0R0J
	R465	RS1/16S6802F
	VR453 (2.2k)	VCP1123
	VR451, VR452 (4.7k)	VCP1154
	Other Resistors	RS1/16S###J

OTHERS

Mark	No. Description	Part No.
	CN451 13P SOCKET	AKP7070
	CN301 19P SOCKET	AKP7073
	U301 TV TUNER PACK	VXF1022

B JCKB ASSY

SEMICONDUCTORS

Mark	No. Description	Part No.
	IC204	BR24L32F-W
	IC701	LA73033M
	IC601	LC75342M
	IC501	MM1504XN
⚠	IC101	MM1565AF
⚠	IC103	NJM78M09FA
	IC202	PEG034B
⚠	IC102	PQ1K333M2ZP
	IC201	PST3245
	IC203	RS5C372A
	IC206	TC74HCT7007AF
	IC205	TC7WU04FU
	Q506, Q508, Q510, Q701	2SA1576A
	Q104	2SB1238X
	Q102, Q103	2SC2411K
	Q105, Q172, Q205, Q702	2SC4081
	Q204	2SD2114K
	Q202, Q203, Q707, Q710	DTA124EUA
	Q206, Q712	DTC124EUA
	Q514	HN1B04FU
	Q708, Q711	HN1C03FU
	Q201	RN1901
	Q703, Q706, Q709	RN4903
	Q101	UMF21N
	D102	1SR154-400
	D203	1SS352
	D201, D716, D717	1SS355
	D601, D602, D604, D605	DF3A5.6FU
	D718-D720	DF3A5.6FU

Mark	No. Description	Part No.
	D103, D202	RB501V-40
	D607	UDZS5.1B

COILS AND FILTERS

Mark	No. Description	Part No.
	L503-L505	LAU100J
	L701	LAU2R2J
	L103	LCYA100J2520
	L102	LTA102J
	L201-L208, L284 CHIP BEADS	VTL1081

CAPACITORS

Mark	No. Description	Part No.
	C211, C220, C225, C226, C543	CCSRCH101J50
	C619-C621	CCSRCH101J50
	C245	CCSRCH120J50
	C516, C522, C528, C720, C721	CCSRCH150J50
	C140	CCSRCH221J50
	C249, C250, C517, C523, C529	CCSRCH270J50
	C542	CCSRCH331J50
	C221, C232, C233	CCSRCH470J50
	C177	CCSRCH561J50
	C702	CCSRCH680J50
	C215	CCSRCH681J50
	C174, C601-C603, C607-C611	CEAT100M50
	C614-C616, C618	CEAT100M50
	C103, C107, C117, C118	CEAT101M10
	C125, C126, C128, C141, C214	CEAT101M10
	C507, C652, C717, C727	CEAT101M10
	C121, C123, C133, C604, C612	CEAT101M16
	C748, C751	CEAT101M6R3
	C704, C716, C719	CEAT102M6R3
	C539	CEAT220M25
	C738	CEAT221M16
	C739	CEAT221M6R3
	C740, C744	CEAT470M16
	C135	CEAT471M16
	C705, C706	CEAT471M6R3
	C137	CEJQ101M16
	C102	CKSQYB225K10
	C129, C224, C606, C617, C747	CKSRYB103K50
	C222, C223, C707, C708	CKSRYB104K16
	C711-C713, C718, C723-C725	CKSRYB104K16
	C728-C730, C732-C735, C737	CKSRYB104K16
	C741	CKSRYB104K16
	C502	CKSRYB105K10
	C241	CKSRYF103Z50
	C104-C106, C115, C116	CKSRYF104Z25
	C119, C120, C122, C124, C127	CKSRYF104Z25
	C130-C132, C134, C136, C139	CKSRYF104Z25
	C173, C175, C202-C204	CKSRYF104Z25
	C216, C217, C228, C234	CKSRYF104Z25
	C239, C240, C244, C246, C501	CKSRYF104Z25
	C519, C525, C531, C605, C613	CKSRYF104Z25
	C653, C709, C710, C714, C715	CKSRYF104Z25
	C726, C731, C736, C749, C750	CKSRYF104Z25
	C752, C760	CKSRYF104Z25
	C101, C209, C210, C212, C213	CKSRYF105Z10
	C218, C219, C227, C231, C236	CKSRYF105Z10

RESISTORS

Mark	No. Description	Part No.
	R208	RS1/10S0R0J
	R178	RS1/16S1501F
	R173	RS1/16S3901F
	R519, R526, R534	RS1/16S5600F
	R602, R605, R606, R615-R617	RS1/16S75R0F
	R704, R715, R717, R718	RS1/16S75R0F
	R728-R730, R740, R743, R747	RS1/16S75R0F
	R757-R759	RS1/16S75R0F
	Other Resistors	RS1/16S###J

OTHERS

Mark	No. Description	Part No.
	X201 (10MHz)	ASS7034
	X203 (4.433619MHz)	VSS1176
	X202 (32kHz)	VSS1197
	CN202 9P FFC CONNECTOR	52045-0945
	CN705 13P FFC CONNECTOR	52045-1345
	CN201 19P FFC CONNECTOR	52045-1945
	CN402 13P PLUG	AKP7059
	CN401 19P PLUG	AKP7062
	CN104 CONNECTOR 13P	B13B-PH-K
	CN105, CN703 CONNECTOR 2P	B2B-PH-K
	JA651 OPT.LINK OUT 8MB/S	JFJ1001
	JA201 JACK	RKN1004
	BT201 LITHIUM BATTERY (CR2032)	VEM1033
	JA701 3P PIN JACK	VKB1150
	JA601 JACK	VKB1183
	JA702 JACK	VKB1184
	CN702 CONNECTOR	VKN1200
	CN701 32P FFC CONNECTOR	VKN1263
	KN801, KN802 WRAPPING TERMINAL	VNF1084

C MAIN ASSY

SEMICONDUCTORS

Mark	No. Description	Part No.
	IC3101	AK5357VT
	IC2301	BA7655AF
	IC1103	CY62148VLL-70ZI
	IC5204	K4S161622D-TC80
	IC1101	K4S281632E-TC75
	IC1401, IC1421	K4S561632E-TC75
	IC1001	M65673WG-A
	IC5002	MM1562FF
⚠	IC4007	MM1603DP
	IC1301	MT48LC4M32B2TG-7
⚠	IC4004, IC4006	NJM2872F05
	IC4206, IC5301, IC5321	NJU7013F
	IC3201	PCM1742KE
⚠	IC4008	PQ015YZ01ZP
⚠	IC4002	PQ070XZ02ZP
	IC4003	PST3428U
	IC4005	PST3809U
	IC3301	SM5950AM
	IC3402	SM8707KV
	IC4101	SN74AHC2G53HDCT
	IC3001	TC74LCX541FT
	IC3002	TC74VHC14FT
	IC5341	TC74VHC157FT
	IC1104	TC7SZ126FU
	IC3403, IC4205, IC5322	TC7WHU04FU
	IC3251	UPC4570G2
	IC5101	UPD72852AGB-8EU-A

Mark	No. Description	Part No.
	IC5202	UPD72893BGD-LML
	IC1102	VYW2176
	IC1201	W986416DH-6
	Q2101-Q2105, Q2201, Q2203, Q2301	2SA1576A
	Q2312	2SA1576A
	Q4000	2SC2411K
	Q2202, Q2222	2SC4081
	Q2302, Q2311	DTC114EUA
	Q2402, Q2403	HN1B04FU
	Q3201, Q3202	RN1903
	Q1102	RN4982
	Q2001	UMF21N
	D3001, D3002, D3101-D3104	1SS355
	D5321	HVC359
	D5322	HVC362
	D4201	MA2ZV05
	D1111	RB521S-30

COILS AND FILTERS

Mark	No. Description	Part No.
	F3102, F3401-F3403, F4201, F5101	DTF1069
	L1001-L1009, L1101, L1102, L1301	DTL1106
	L1401, L1402, L3301, L5501-L5505	DTL1106
	L5507, L5508 EMI FILTER	DTL1106
	L5301, L5321	LCYA100J2520
	L4202	LCYA1R2J2520
	F3201	VTF1096
	L2101	VTL1067
	L4201	VTL1079
	L5103-L5106	VTL1082

CAPACITORS

Mark	No. Description	Part No.
	C5311, C5329	CCSRCH100D50
	C3253, C3258	CCSRCH101J50
	C5105	CCSRCH271J50
	C5325, C5327	CCSRCH330J50
	C3207	CCSRCH331J50
	C4208	CCSRCH390J50
	C5131-C5138	CCSRCH4R0C50
	C5326	CCSRCH5R0C50
	C3254, C3257	CCSRCH681J50
	C5121, C5122	CCSRCH8R0D50
	C2208, C2317, C4034, C5322	CEVW100M16
	C3251, C3255, C4001, C4002, C4004	CEVW101M16
	C4029, C4037	CEVW101M16
	C2101, C2221, C2405, C3201, C3204	CEVW101M6R3
	C3206	CEVW101M6R3
	C2301	CEVW220M6R3
	C1054, C1061, C3301, C4022	CEVW221M4
	C3106	CEVW2R2M50
	C5321	CEVW470M16
	C2308, C3102, C3107, C4003, C5341	CEVW470M6R3
	C5301	CEVW4R7M35
	C1031, C1032, C1503-C1506	CKSQYB104K16
	C2204, C4206, C5309	CKSQYB105K10
	C1901, C4014, C4019, C4033	CKSQYB225K10
	C1004, C1012, C1014, C1029, C1034	CKSRYB102K50
	C1040, C1044, C1049, C1051	CKSRYB102K50
	C1110, C1111, C1207, C1208, C1307	CKSRYB102K50
	C1311, C1313, C1407, C1408	CKSRYB102K50
	C1427, C1428, C3303, C3408	CKSRYB102K50
	C1003, C1027, C1037, C1052, C1109	CKSRYB103K50
	C1206, C1305, C1308, C1310, C1406	CKSRYB103K50
	C1425, C2305, C3003, C3004, C4018	CKSRYB103K50
	C4020, C4207, C5214, C5222, C5224	CKSRYB103K50
	C1508-C1510, C2311, C4104, C5306	CKSRYB104K16
	C4103	CKSRYB223K50
	C5328	CKSRYB473K25
	C2202	CKSRYB563K16
	C1002, C1005, C1007-C1010, C1016	CKSRYF104Z25
	C1018, C1019, C1021-C1023	CKSRYF104Z25
	C1025, C1026, C1028, C1030, C1035	CKSRYF104Z25
	C1038, C1041, C1042, C1047, C1102	CKSRYF104Z25
	C1105, C1106, C1108, C1114, C1202	CKSRYF104Z25
	C1204, C1302, C1304, C1312, C1402	CKSRYF104Z25
	C1404, C1422, C1424, C2102-C2106	CKSRYF104Z25
	C2201, C2206, C2222, C2223, C2306	CKSRYF104Z25
	C2319, C2406, C2407, C3006, C3101	CKSRYF104Z25
	C3105, C3108, C3202, C3203, C3205	CKSRYF104Z25
	C3252, C3256, C3302, C4006-C4008	CKSRYF104Z25
	C4010, C4012, C4013, C4017, C4021	CKSRYF104Z25
	C4024-C4026, C4032, C4202, C4203	CKSRYF104Z25
	C4209, C5113, C5118, C5120	CKSRYF104Z25
	C5125-C5127, C5204, C5215, C5218	CKSRYF104Z25
	C5225-C5228, C5230, C5308, C5310	CKSRYF104Z25
	C5323, C5342, C5343	CKSRYF104Z25
	C1001, C1006, C1048, C1103, C1107	CKSRYF105Z10
	C1203, C1205, C1209, C1303, C1306	CKSRYF105Z10
	C1309, C1403, C1405, C1409, C1423	CKSRYF105Z10
	C1426, C1429, C3001, C3404-C3407	CKSRYF105Z10
	C4027, C4030, C4105, C4107, C4201	CKSRYF105Z10
	C4401, C4501, C5110	CKSRYF105Z10
	C4028 (4.7/6.3V)	DCH1200
	C3402, C3403, C4015 (10/10V)	VCG1045
	C1060 (150/4V)	VCH1246
	VC4201 (10pF)	VCM1012

RESISTORS

Mark	No. Description	Part No.
	R1025, R1026, R1042-R1046	RAB4CQ103J
	R1048-R1051, R1054, R1068, R1069	RAB4CQ103J
	R1072, R1073, R5218-R5221	RAB4CQ103J
	R5229, R5230, R5247, R5249-R5252	RAB4CQ103J
	R5255, R5258, R5259, R5273-R5275	RAB4CQ103J
	R5289, R5290	RAB4CQ103J
	R1408-R1411	RAB4CQ220J
	R4401, R4404, R4410, R4416, R4417	RAB4CQ223J
	R4423, R4502, R4506, R4512	RAB4CQ223J
	R4518, R4519, R4525	RAB4CQ223J
	R1114-R1117, R4405-R4408, R4436	RAB4CQ330J
	R4507-R4510, R4538	RAB4CQ330J
	R1303-R1310, R1404-R1407	RAB4CQ560J
	R1423-R1426	RAB4CQ560J
	R1203-R1206	RAB4CQ680J
	R5103	RN1/16SE5101D
	R5108	RN1/16SE9101D
	R1207, R1502, R1507, R2017, R3002	RS1/10S0R0J
	R3102, R3201, R3252, R4001, R4006	RS1/10S0R0J
	R4009, R4014, R4016, R4108, R4109	RS1/10S0R0J
	R5209, R5322	RS1/10S0R0J
	R4019	RS1/10S1001D
	R5321	RS1/10S101J
	R1501	RS1/10S2202F
	R4020	RS1/10S5600D

Mark	No.	Description	Part No.
	R4013		RS1/16S1001F
	R3254, R3266		RS1/16S1002F
	R4012		RS1/16S1200F
	R3253, R3265		RS1/16S1201F
	R4011		RS1/16S1501F
	R1021, R1023		RS1/16S2201F
	R3251, R3269		RS1/16S2202F
	R2105, R2106, R2111, R2112, R2115		RS1/16S3300F
	R4018		RS1/16S3600D
	R5104-R5107		RS1/16S56R0D
	Other Resistors		RS1/16S###J

OTHERS

CN5102	7P FFC CONNECTOR	VKN1411
CN4401, CN4501	40P FFC CONNECTOR	VKN1811
CN1901	7P FFC CONNECTOR	VKN1812
CN4001	8P FFC CONNECTOR	VKN1813
CN3001	24P FFC CONNECTOR	VKN1814
CN2001	32P FFC CONNECTOR	VKN1815
KN3	EARTH METAL FITTING	VNF1109
X4201	(27.000MHz)	VSS1146
X5101	(24.576MHz)	VSS1184
X4102	VCXO(27MHz)	VSS1195

D FLKY ASSY

SEMICONDUCTORS

IC1001	PT6315

COILS AND FILTERS

L1001	LAU220J

SWITCHES AND RELAYS

S1001, S1002, S1004-S1009	VSG1024

CAPACITORS

C1012	CEJQ101M6R3
C1010	CEJQ220M35
C1001-C1004, C1020	CKSRYB103K50
C1006, C1009, C1013	CKSRYF104Z25
C1011	CKSRYF105Z10

RESISTORS

Other Resistors	RS1/16S###J

OTHERS

CN1001	19P FFC CONNECTOR	9607S-19F
V1001	FL TUBE	VAW1081
CN1002	CONNECTOR	VKN1183
2	FL HOLDER	VNF1129

E KIRB ASSY

SEMICONDUCTORS

Q1201, Q1202	DTC124EUA
D1203	SLR-343BBT
D1201	SLR-343DC

SWITCHES AND RELAYS

S1201-S1203	VSG1024

CAPACITORS

C1201, C1202, C1204	CKSRYF104Z25

Mark	No.	Description	Part No.

RESISTORS

R1210	RS1/10S0R0J
R1206, R1207	RS1/10S182J
R1204	RS1/10S271J
Other Resistors	RS1/16S###J

OTHERS

IC1201	REMOTE RECEIVER UNIT	RPM7140-H9
CN1201	CONNECTOR	VKN1183

F FRJB ASSY

CAPACITORS

C1308, C1309	CCSRCH471J50

RESISTORS

R1501, R1502	RS1/10S0R0J
Other Resistors	RS1/16S###J

OTHERS

CN1301	13P FFC CONNECTOR	52492-1320
JA1301	YC CONNECTOR(VERTI)	VKB1190
JA1302	3P JACK(VERTICAL)	VKB1206
KN301	WRAPPING TERMINAL	VNF1084

G ATWB ASSY

OTHERS

CN14	40P ATA CONNECTOR	VKN1816
CN13	40P FFC CONECTOR	VKN1879

H ATHB ASSY

OTHERS

CN12	40P ATA CONNECTOR	VKN1816
CN11	40P FFC CONNECTOR	VKN1879

I POWER SUPPLY UNIT

POWER SUPPLY UNIT has no service part.

J DVJB ASSY

RESISTORS

Other Resistors	RS1/16S###J

OTHERS

JA1401	DV TERMINAL	VKB1207
CN1401	CONNECTOR	VKN1183

6. ADJUSTMENT

6.1 TUNB ASSY ADJUSTMENT

* It is not necessary to adjust the ASSY normaly when exchanging the ASSY. But the adjustment is necessary when exchanging the Tuner Module and IC451 stereo decoder IC.

No.	Adjustment Name	Adj. Point	Measurement Point	Adjustment Value	Adjustment State
1	Stereo Decoder ATT adjustment (Input system adjustment)	VR453	Audio ouput (L) (Rear panel)	370mVrms ± 18.5mV	Input a signal of Mono 1kHz/100% modulation to terrestrial tuner input. /through output.
2	Stereo Decoder Wideband adjustment (Input system adjustment)	VR451	Audio ouputs (L/R) (Rear panel)	Best point of separation ≥30dB Note 1	Input a signal of Stereo 300Hz/30% modulation (NR-ON/L ch only) to terrestrial tuner input. Note 2
3	Stereo Decoder Spectral adjustment (Input system adjustment).	VR452	Audio ouputs (L/R) (Rear panel)	Best point of separation ≥25dB Note 1	Input a signal of Stereo 3kHz/30% modulation (NR-ON) to terrestrial wave input. /through output Note 2

Note 1 : The values for channel separation is defined as those having passed through the following filters :
100Hz – 10kHz : +0/–0.5dB
15.75kHz – 100kHz : -40dB or more

Note 2 : The adjustment No.2 and No.3 should be repeated 2 times for good adjustment.
(Steps : No.1 → No.2 →No.3 →No.2 →No.3)

A TUNB ASSY

SIDE A

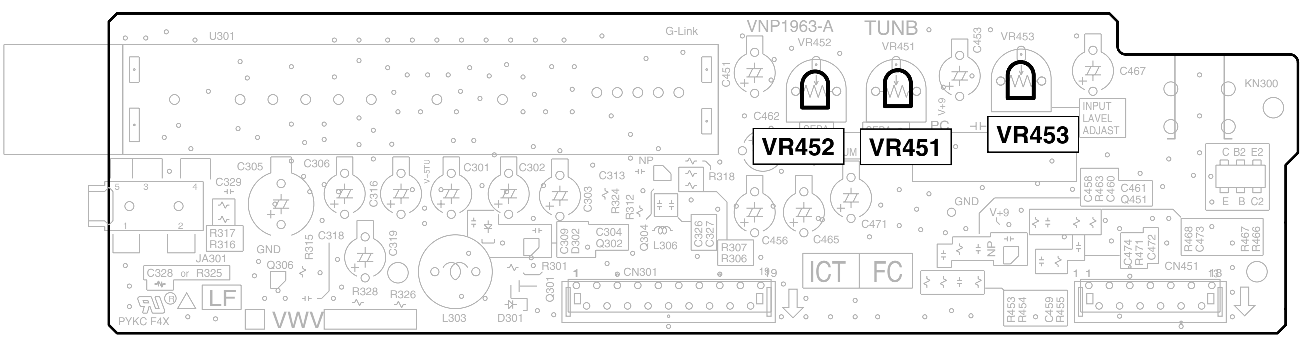


Fig.1 Adjustment Points (TUNB ASSY)

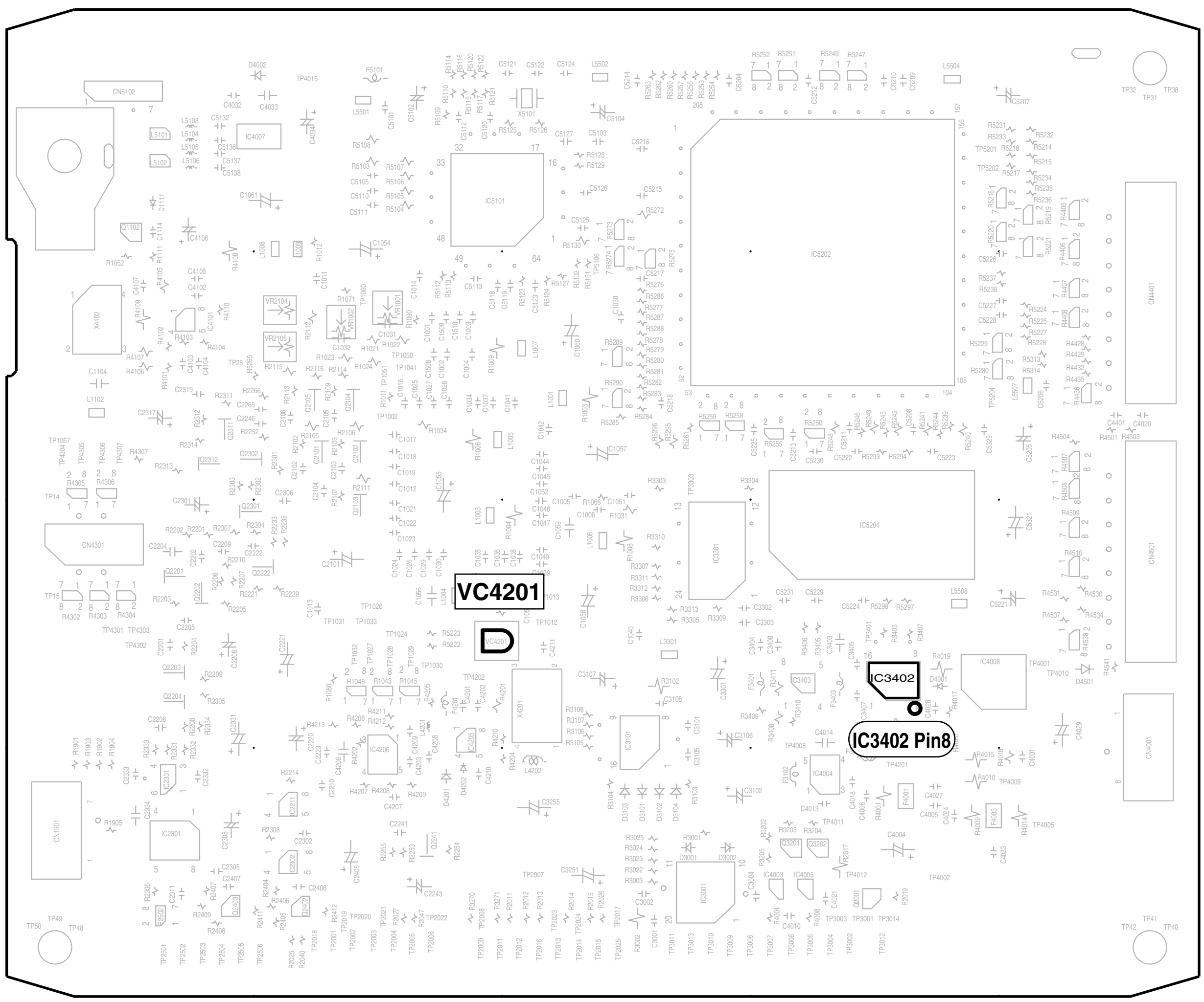
6.2 MAIN ASSY ADJUSTMENT

* It is not necessary to adjust the ASSY normaly when exchanging the ASSY, but confirm the data.

No.	Adjustment Name	Adj. Point	Measurement Point	Adjustment Value	Adjustment State
1	Master clock free-running adjustment (Clock system adjustment)	VC4201	MAIN ASSY IC3402 Pin8 (XTO) (SM8707KV)	27.000000MHZ ± 130Hz	No signal input

C MAIN ASSY

SIDE A



7. GENERAL INFORMATION

7.1 DIAGNOSIS

Service Diagnosis List

7.1.1 CPRM ID NUMBER AND DATA SETTING

The Setting is necessary

- " CPRM ERR" is displayed on the FL display immediately after the power is turned on or in Stop mode.
- When the MAIN ASSY , DRIVE ASSY or the FLASH ROM is exchanged.

7.1.2 MODEL SETTING

7.1.3 DOWNLOAD METHOD

The Setting is necessary

- When the MAIN ASSY is replaced.
- When the JCKB ASSY is replaced.
- When the MAIN ASSY and JCKB ASSY is replaced.

7.1.4 SERVICE MODE

[First Screeen] (Version information, etc)

[Sub Screen 1] (Result of error-rate measurement : Video mode/VR mode)

[Sub Screen 2] (HDD information)

[Second Screen] (ATA/ATAPI debug screen)

[Sub Screen 3] (writer maintenance information of ATA/ATAPI DEBUG OSD)

[Sub Screen 4] (ATA/ATAPI DEBUG OSD_LD degradation judgement)

[Fourth Screen] (VR-recording error log)

[Sub Screen 4] (Error log for VR recording)

[Fifth Screen] (Error log for VR playback)

[Sub Screen 2] (Error log for VR playback)

7.1.5 DV DEBUG MODE

[Third Screeen] (DV debug information)

7.1.6 ERROR RATE MEASUREMENT

Only Video mode measurement

7.1.7 VIDEO ADJUSTMENT FOR SPECIFIC AREA

Purposes:

Depending on the area, jitter may appear in a picture received by the tuner, as conditions of signals received by the tuner are different from area to area. To correct this kind of problem, the function of the System Codec AVIO control section for adjusting signals received by the tuner can be used.

7.1.8 AGING MODE

7.1.1 CPRM ID NUMBER AND DATA SETTING

■ Entering the ID Number and ID Data for DVD Recorder

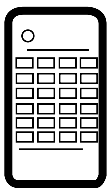
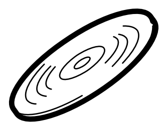
For the DVD recorder,it is necessary with the recoding/playback of DVD–RW disc to set an individual number (ID number) and ID data to each recorder. If the number and data are not set correctly with the following procedure, operations in the future may not be guaranteed. You will find the ID number to be set on the ID label on the rear panel.

Important: If no ID label is found on the rear panel, write down the specified ID number by checking it according to "How to confirm the ID number" shown below.

■ The Input is Necessary When:

- " CPRM ERR" is displayed on the FL display immediately after the power is turned on or in Stop mode.
- When the MAIN ASSY , DRIVE ASSY or the HDD is exchanged.

JIGS AND MEASURING INSTRUMENTS

 Service Remote Control Unit (GGF1381)	 DVD Recorder Data Disc (GGV1179) (*) Refer to P138.

Input Flow of the ID No. and ID data when exchanging HDD, MAIN Assy or Drive Assy

A

- When exchanging HDD or MAIN Assy, or both exchanged
- When exchanging HDD

When exchanging Drive Assy

When displayed "CPRM ERR"

Power → ON

Also exchanging DRIVE Assy simultaneously

B

When displayed following message at Power on
FL Tube : [HDD ERR]
CRT display :

HDD information is not correct.

Only exchanging Drive Assy

When displayed following message at Power on
FL Tube : [CPRM ERR]
CRT display :

CPRM information is not correct.

■ Confirmation of the CPRM ID No.

C

■ Deletion of the CPRM ID No.(when ID No. is registered.)

■ Input of the CPRM ID No. and ID data

Power → OFF → ON

Normal operation mode

- New HDD/when there is error on recorded contents
- Exchanging to the original HDD(when there is no error on the recorded contents.)

D

End

End

When displayed following message at Power on
FL Tube : [HDD ERR]
CRT display :

HDD information is not correct.
Execute HDD Initialize from the Disc Setup menu.

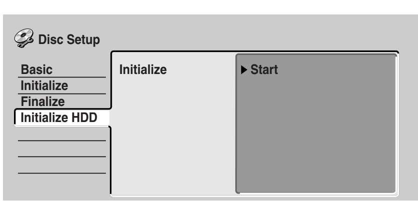
[CAUTION]

All recorded data are deleted if the HDD is intialized.
Take care that restoration of the user's data recorded on the HDD is totally impossible.
Before servicing, **OBTAIN THE USER'S PRIOR CONSENT** to that effect.

*Use Remote Control of the model

E

Execute
HOME MENU → Disc Setup → Intialize HDD → Start



*Goes to normal operation with no caution

End

F

How to Input the ID Number and ID Data

Note:
Be sure to enter the ID number in Stop mode.
Use the service remote control (GGF1381) for operations. Only opening/closing of the tray are performed from the player.
The ID data disc is swept out automatically after the recorder has read the data from it.

① To enter the input mode, press ESC + STEREO sequentially in a status with no ID number set, such as after FLASH-ROM downloading.

② As number input is enabled when the unit enters the input mode, input the 9-digit ID number.
(The entered number is also displayed on the FL display.)

```
[Recorder's ID Number Setting]
  ID Number ?
> - - - - - - - - -          ← ②

<CLEAR>  Exit


Input ID Number !
```

③ After inputting the number, press SEARCH to register the ID number.

```
[Recorder's ID Number Setting]
  ID Number ?
> 0 0 0 0 0 0 0 0 1   OK ?

<PLAY>      Compare Mode
<SEARCH>  Enter              ← ③

Input ID Number !
```

④ When the ID number has been registered, the unit enters the ID data input mode. (The FL display indicates "INSERT ID.")
In this condition, place the ID data disc on the tray and close the tray using the CLOSE key "■/⏏" on the player.

```
[Recorder's ID Data Setting]


<CLEAR>  Exit


Insert The ID Data Disc !    ← ④
```

⑤ While the data are being read, the message shown in the figure at left is displayed on the screen.
(The FL display indicates "LOAD ID.")

```
[Recorder's ID Data Setting]






Loading The ID Data Disc !   ← ⑤
```

⑥ When the ID data have been read, the data are written to the FLASH-ROM.
(The FL display indicates "WRITE ID.")

```
[Recorder's ID Data Setting]



Wait Rom Writing !           ← ⑥
```

⑦ When the ID data have been written to the FLASH-ROM, the message "Rom Write OK" is displayed on the screen.
(The FL display indicates "ID DATA OK.")

⑧ After confirming this message, press CLEAR to exit the input mode.

```
[Recorder's ID Data Setting]


Rom Write OK !               ← ⑦


<CLEAR>   Exit               ← ⑧
```

How to Confirm the ID Number

1. Press ESC + STEREO sequentially with an ID number already set, and the unit enters the ID number confirmation mode.
2. The set ID number is displayed on the screen (and on the FL display), permitting you to confirm it.
3. To exit this mode, press CLEAR .

```
    [Recorder's ID Number Setting]
      ID Number ?
②→  [ 0 0 0 0 0 0 0 0 1]
    Compare
    > * * * * * * * * *
③→  <CLEAR>  Exit

    Input ID Number !
```

How to Clear the ID Number

1. Press ESC + STEREO sequentially with an ID number already set, and the unit enters the ID number confirmation mode.
2. Input the same number as the ID number you have set.
3. After inputting the number, press STOP .
   Only when the entered number matches the set ID number, the ID number is cleared and the unit exits this mode.
   If the numbers do not match, you must return to step 2.
   (STOP is not accepted until 9 digits are entered.)

```
    [Recorder's ID Number Setting]
      ID Number ?
     [ 0 0 0 0 0 0 0 0 1]
    Compare
②→  > * * * * * * * * *
    <CLEAR>  Exit
    <STEREO>  ID Data Setting Mode
    Input ID Number !
```

➡

```
    [Recorder's ID Number Setting]
      ID Number ?
     [ 0 0 0 0 0 0 0 0 1]
    Compare
    > 0 0 0 0 0 0 0 0 1   OK ?
    <PLAY>  Enter
③→  <STOP>  Memory Clear
    <STEREO>  ID Data Setting Mode
    Input ID Number !
```

7.1.2 MODEL SETTING

- **The Setup is Necessary When :**

a) When the MAIN Assy is replaced
b) When the JCKB Assy is replaced
c) When the MAIN Assy and JCKB Assy are replaced

Note : Make sure of setting the correct number.

- **How to Setup the Model**

1) After power on, the following screen is displayed on TV monitor.
   Press " 22 " by using the remote control unit for service(GGF1381).

```
[ Recorder 's  Model  Setting]
  Input the number by using the remote for Service.

  > --

  Input  No.        Model
  [     22       :   DVR-520H-S      ]
  [     23       :   DVR-65H-S       ]
```

2) After 1), the following screen is displayed on TV monitor.
   Press " 011 " by using the remote control unit for service.

```
[ Recorder 's  Type  Setting]
  Input the number by using the remote for Service.

  > ---                    (Type  -- ,  Region  No.  -)

  Input  No.        Type
  [     01       :   KU/CA    <US>                ]
```

   The setting complete when OSD is disappeared.

3) Unplug the power cable.
4) Reset the recorder to all its factory settings.
   1. Make sure that the recorder is on.
   2. Press and hold [STOP] and press [STANDBY/ON] key on the front panel.
      The recorder turns off with all settings reset.
5) Enter the Service Mode and then confirm the Model Name " DVR-520H/KU/CA ".
   1. Make sure that the recorder is on.
   2. Press [ESC] then [DISP] keys by using the remote control unit for Service.

```
DVR-520H/KU/CA
  VERSION   :  0.60
  SYSCON    :  RELEASE_45
               Rev     :1.3685  $
 TUFLCON    :  1.22     MASK              OK
    DRIVE   :  DVD-RW DVR-107X            OK
               1.10K                      OK
               CKT0000353WL               OK

      HDD   :  ST380012ACE                80
   DEVICE   :  PRISM-PLUS
   REGION   :  1
        C   :  * * * * * * * * *
   FLASH    :  64M
```

Notes :

1) After the setting complete, you can NOT CLEAR the seting data.
   Make sure the pressing number.
2) " NG " is appeared on TV when unsuitable number is pressed.
   In such a case, please unplug the power cable and plug it again. Then restart the model setting.

7.1.3 DOWNLOAD METHOD

• The Download is Necessary When :
a) After model setting
b) When "NG" is displayed at First screen (version information, etc)

[Notes]
Be sure NOT to turn off the unit during downloading.
If the unit is turned off during downloading, the SYSCON, TUFLCON, and DRIVE programs may not be properly rewritten, in which case the unit may not be able to initialize itself normally when turned on again. If that happens, repair the unit, as described below, then perform downloading again:

• In a case where the power to the unit was shut off during rewriting of the SYSCON program:
The SYSCON program will not function properly if the power to the unit is forcibly shut off while the message "DOWNLOAD-1" is displayed on the FL display during downloading. If downloading of the programs from the disc or through serial communication becomes impossible, replace the FLASH ROM.
• In a case where the power to the unit was shut off during rewriting of the DRIVE program:
The DRIVE program will not function properly if the power to the unit is forcibly shut off while the message "DOWNLOAD-2" is displayed on the FL display during downloading. If downloading of the programs from the disc or through serial communication becomes impossible, replace the DRIVE ASSY.
• In a case where the power to the unit was shut off during rewriting of the TUFLCON program (only for the flash-type TUFLCON microcomputers):
The TUFLCON program will not function properly if the power to the unit is forcibly shut off while the message "DOWNLOAD-3" is displayed on the FL display during downloading. If downloading of the programs from the disc or through serial communication becomes impossible, replace the TUFLCON microcomputer.

1. DISC DOWNLOAD METHOD

• How to Download
This is disc download method to save the initial setting data and user setting data.
However, the following data is deleted after downloading by this method.
* Disc history data
* REC mode
* Last channel (Before turn unit off)

1) Open a disc tray in the " DVD " function.
2) Put the download disc on the tray.
3) Press and hold a " STOP " button for playback,
then press a " DISC NAVIGATOR " button on a front panel.
- The disc tray closes automatically and the disc is loaded.
- The disc tray opens automatically after loading.
4) Take out the Download Disc.
- " DISC DWLD " is displayed on FL and download is started.
- The display on FL changes to " DOWNLOAD-1 "
- The display on FL changes to " DOWNLOAD-2 "
- The display on FL changes to " DOWNLOAD-3 " (*)
- After download is completed, the power turns off, and turns on and a disc tray closes automatically.
* It takes for about 5 minutes until download is completed.
5) Press and hold a " ESC ", then press " DISP " on a test mode remote control unit for the release version confirmation.
6) Confirm a firmware release version.
7) Press " ESC " on a test mode remote control unit in order to exit the test mode.

(*) : " DOWNLOAD-3" is displayed only when the TuFL u-com is FLASH type.

2. Serial DOWNLOAD METHOD

[Notes]

This method is secondary way when the disc loading is impossible.

• JIGS

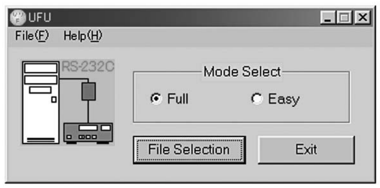
* PC with serial port
* RS232C straight cable
* RS232C I/F jig (GGF1348)
* 7P FFC (VDA1681)
* Download program (UFU.exe)
* Firmware

• Connection

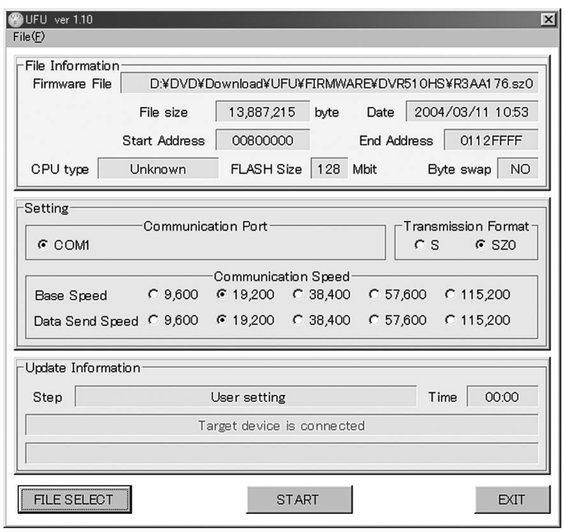
PC ⇔ RS232C cable ⇔ RS232C I/F ⇔ 7P FFC ⇔ DVD Recorder

• How to Download

1) Connect the 232C I/F JIGS above way.
2) Turn on the PC and start the " UFU.exe ".



. 3) Select the Firmware file. ("sz0" file)
4) Turn the DVD recorder on and start the download program.
" Target Device is connected" is appeared on the screen.



. 5) Select the Communication Speed (Baud Rate)
a) Base Speed 38,400
b) Data Send Speed 115,200
6) START
* Even if you click "START" button,
sometimes "Communication Error" may come out one to twice, and download may fail.
In this case, please click "START" again.
* Other factors can be considerd if download fails 3 times or more.
* And it takes about an hour for updating the firmware.

7.1.4 SERVICE MODE

For service operations, use the GGF1381 remote control unit for service.
The Service-mode screens consist of nine mode screens, which are classified into such rough categories as recording system and VR playback system, and their subscreens.

- **How to enter Service mode** : Press the ESC then DISP keys in turn while no GUI is displayed. The first screen (version information, etc.) shown below is displayed.
- **How to exit Service mode** : Press the ESC key.
- **How to advance to the next Service-mode screen** : While the first screen is displayed, press directly one of the keys 1-9. For service, use the keys 2, 4 or 5, as shown below.
- **How to advance to a subscreen within the same Service-mode screen** : Press the DIG/ANA key. Pressing the DIG/ANA key repeatedly will change the subscreens within the same Service-mode screen cyclically.

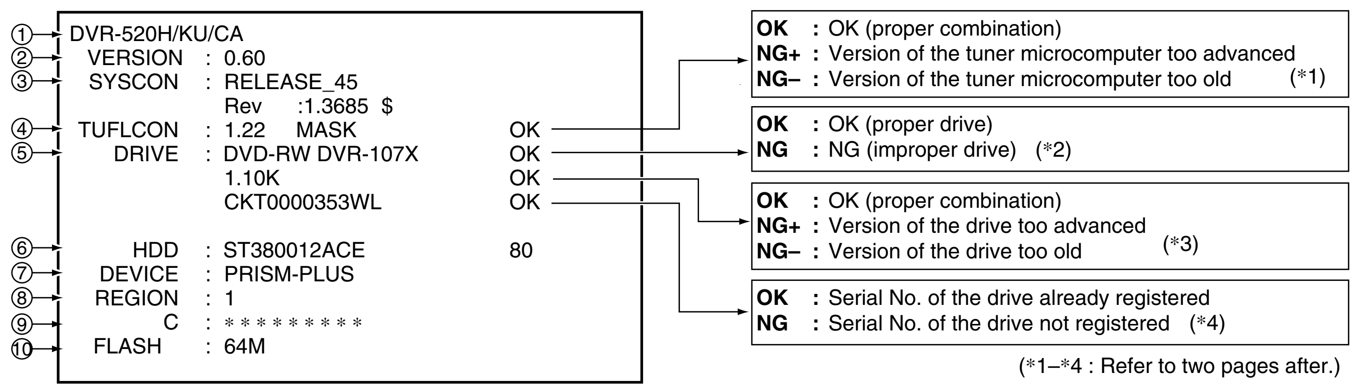
■ The Service-mode screens to be used for service are as follows:

1 = First screen: Version information, etc.
2 = Second screen: ATA/ATAPI debug screen (Writer data)
4 = Fourth screen: Error log for the VR recording system
5 = Fifth screen: Error log for the VR playback system

Note: After entering one of the Service-mode screens, if you wish to shift to another Service-mode screen, exit Service mode first, then reenter Service mode and select your desired Service-mode screen.

■ Description of Each Service-mode screen

1. First screen (version information, etc.)

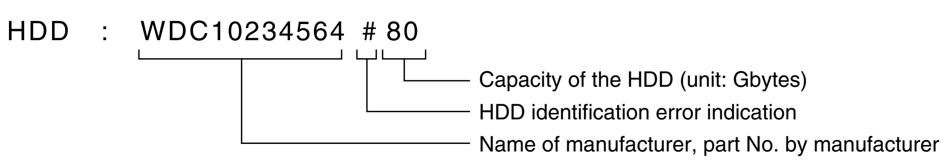


(*1–*4 : Refer to two pages after.)

① Model name/destination
② Version of the recorder software
③ Revision No. of the system-control computer software (Edition administration No. [from top to bottom, common software, firmware, application software])
④ Version No. of the tuner microcomputer, Mask or Flash
Result of the combination ckeck with system u-com
⑤ Information on the built-in drive
(Model name, version No., model type, serial No.)
⑥ Data of the built-in HDD, capacity of the HDD
⑦ Version No. of PRISM
⑧ Region No.
⑨ CPRM data (CPRM key No.)
⑩ FLASH ROM information

While the first screen shown above is displayed, press the DIG/ANA key to enter the subscreen shown below.
Note: Each time the DIG/ANA key is pressed, the display changes between the first screen and its subscreen.

• Details on HDD data are described below:



If any abnormality exists in HDD connection, the indications shown in Table 1 below are displayed.

Table 1: HDD data indications according to various HDD connection statuses

HDD identification conditions	Example of HDD data to be displayed	Remarks
Failure in physical identification of HDD (no connection, defective HDD, interface error)	Blank space	
Physical identification of HDD possible, but not identified	WDC 10234564 # 80	"#" is displayed as HDD identification error
Physical identification of HDD possible, HDD identified, but failure in logical formatting	WDC 10234564 ! 80	"!" is displayed as HDD identification error
Physical identification of HDD possible, HDD identified, and correct logical formatting (HDD correctly identified)	WDC 10234564 80	

While the first screen shown above is displayed, press the DIG/ANA key to enter the subscreen shown below.
Note: Each time the DIG/ANA key is pressed, the display changes between the first screen and its subscreen.

• Subscreen 1: Result of error-rate measurement

```
ERR RATE    :  x.xe-x/
```

Note: Be sure to start playback after displaying this subscreen to calculate the error rate.

During playback in VR mode, the average error rate of the past 10 VOBUs is displayed, and during playback in DVD-Video or Video mode, the average error rate of the past 256 sectors is displayed. During playback in VR mode, the rotation rate of the drive (/: normal speed, no display = double speed) is also displayed.

• Subscreen 2: HDD information

```
HDD Info
Life Time: 87599h 09m 05s
```

Cumulative HDD-on time

• How the data on cumulative HDD-on time are processed in memory

Storage place: Backup SRAM, Flash ROM

Timing of referring to the data on cumulative HDD-on time: When the power is turned on, the backup SRAM is referred to regarding the data on cumulative HDD-on time, and the data are stored in the RAM. If referring to the backup SRAM fails, the flash ROM is referred to.

Timing of updating the data on cumulative HDD-on time: While the HDD is on, the data on cumulative HDD-on time in the RAM is updated every 3 seconds, and every time updating is executed the data are stored in the backup SRAM. When the power is turned off, the data are stored in the flash ROM.

How to clear the data on cumulative HDD-on time

Backup SRAM: When the HDD Identification Setting is performed, the data on cumulative HDD-on time are automatically cleared. The HDD Identification Setting is automatically performed when the CPRM setting is performed on the CPRM setting screen (to display the CPRM setting screen, press the ESC then the STEREO keys).

Notes: The data on cumulative HDD-on time are not cleared when resetting to factory-preset values is performed.
The data on cumulative HDD-on time are not cleared when the system-control computer software is downloaded.

Flash ROM: The data on cumulative HDD-on time cannot be cleared (they are not cleared even if resetting to factory-preset values is performed or if the system-control computer software is downloaded).

Note: The data on cumulative HDD-on time in the flash ROM can be cleared if you clear the data in the backup SRAM following the above-mentioned procedures then turn off the power of the unit, because the data in the backup SRAM are stored in the flash ROM when the power is turned off.

• When "NG" is displayed at First screen (version information, etc)

(*1) NG+ : Version of the tuner microcomputer too advanced
NG- : Version of the tuner microcomputer too old

1. When TUFL μ-com is MASK type
NG+ : Download the firmware.
NG- : Replace the TUFL μ-com or JCKB ASSY.

2. When TuFL μ-com is FLASH type
NG+ : Download the firmware.
NG- : Download the firmware.

(*2) NG : NG (improper drive)

Replace the correct Drive Assy.

(*3) NG+ : Version of the drive too advanced
NG- : Version of the drive too old

NG+ : Download the firmware.
NG- : Download the firmware.

(*4) NG : Serial No. of the drive not registered

Check the part No. and replace the correct Drive Assy.

2. Second screen (ATA/ATAPI debug screen)

Subscreen 1 of the second screen is displayed when the ESC, DISP, then "2" keys are pressed, in that order.
Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 4.

• Subscreen 1: Command log (ALL) of ATA/ATAPI DEBUG OSD

```
ATA/ATAPI  History - ALL
 32 010000000000A000          OK
 32 2A00000DEBB000063000      OK
 32 2A00000DF1E000063000      OK
 32 2A00000DF81000063000      OK
 32 2A00000DFE4000062000      OK
 32 2A00000E04600006300 0     OK
 32 2A00000E0A9000063000      OK
 32 2A00000E10C000063000      OK
>32 2A00000E16F000062000 23A00
```

(Not for Service)

• Subscreen 2: Command log (ERROR) of ATA/ATAPI DEBUG OSD

(Not for Service)

• Subscreen 3: Writer mentenance information of ATA/ATAPI DEBUG OSD

The cumulative power-on time and error log that are administered by the writer are displayed. Such information is obtained when the power is turned on. Thereafter, each time the SEARCH key on the remote control unit for service is pressed while subscreen 3 is displayed, the updating command is sent, and the data on the subscreen are updated. Care must be taken when updating this subscreen, because an undesired command is inserted if it is executed while recording, etc.

```
    ATA/ATAPI  Writer  MaintenanceInfo
①→ Power ON    00 00 00 0000 00000000
    0102:56     01 00 00 0000 00000000
    DVD         02 00 00 0000 00000000
②→ R0053:48    03 00 00 0000 00000000  ← Error log for the Writer
③→ W0022:16    04 00 00 0000 00000000
    CD          05 00 00 0000 00000000
④→ R0034:04    06 00 00 0000 00000000
⑤→ W0000:00    07 00 00 0000 00000000
                     00-00
```

(Not for Service)

① Power-on time/cumulative power-on time
② Duration of emission of the laser diode (LD) for DVD-R/DVD while reading
③ Duration of emission of the LD for DVD-W/DVD while writing
④ Duration of emission of the LD for CD-R/CD while reading
⑤ Duration of emission of the LD for CD-W/CD while writing

(Reference)
MTTF time of each LD (as the guideline of life span of each LD)
R7R Drive Assy (Read + Write total time)
DVD : 4700h
CD : 11000h

• Subscreen 4: ATA/ATAPI DEBUG OSD_LD degradation judgment

The degrees of degradation of the LD (laser diode) for the writer (LDs for CD and DVD separately), temperature, and RF level are displayed. To update the data on the subscreen, press the SEARCH key on the remote control unit for service while subscreen 4 is displayed. See Table 1 below for a description of each item and the conditions for updating data.

```
   ATA/ATAPI- LD Degrade

①→ CD  :0070  104%  OK
②→ DVD :0068   96%  OK
③→ TMP :00A3   41 °C
④→ ADJ :0067   26 °C
⑤→ RF  :3D70
⑥→ TLT :FFD5
```

Table 1: Description of each item and conditions for updating data

No.	Item	Description	Conditions for updating by pressing the SEARCH key	Remarks
①	CD	Degradation judgment of LD for CD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive)	No disc inserted in the disc tray	∗1
②	DVD	Degradation judgment of LD for DVD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive)	No disc inserted in the disc tray	∗1
③	TMP	Current temperature inside the Writer	No disc inserted in the disc tray	∗1
④	ADJ	Temperature (approx. 25°C) inside the Writer during adjustment	No disc inserted in the disc tray	∗1
⑤	RF	RF level (16-bit data, proportional calculation performed using the actual RF level value with 2.5 V = 0xFFFF as the maximum value, displayed in 4-digit hexadecimal)	During playback of disc medium	∗2
⑥	TLT	Writer adjustment data for straight (non-HDD) model (FFFF is diplayed when the writer is not adjusted.)	No condition	

∗1 : For correct judgment, after leaving the unit at a normal temperature (25°C typ.) for some time, judgment must be performed immediately after the unit is turned on with no disc loaded.

∗2 : Use this item only for confirmation before and after lens cleaning, as the lens becomes dirty with dust.

3. Fouth screen (VR-recording-related error log)

Subscreen 1 of the fourth screen is displayed when the ESC, DISP, then "4" keys are pressed, in that order.
Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 11.

A

• Subscreen 1:

```
RunFnc : ---- Ecl : ****  Rate : **
                    ----------------------
                    ----------------------
                    ----------------------
                    ----------------------
                    ----------------------
                    ----------------------
```

(Not for Service)

B

• Subscreens 2 and 3:

These subscreens are not for service use.

• Subscreen 4: Error log for VR recording

```
① →  Recording Error History Display
01–06–01 20:05:30 No SysHdr IN
01–06–02 00:22:10 Write Error
```

C

① Recording-related error log for the last 18 errors, divided into 2 screens
(generation time [year-month-day, hour:minute:second], error data in simplified description)

Notes:
- For details on error messages, see Table 2 "Description of VR-recording-related errors".
- The two error-log screens can be switched by pressing the SPEED+ or SPEED- key.

D

• Subscreens 5 to 11:

These subscreens are not for service use.

E

F

4. Fifth screen (Error log for VR playback)

Subscreen 1 of the fifth screen is displayed when the ESC, DISP, then "5" keys are pressed, in that order.
Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 4.

• Subscreen 1:

```
G : 001–01   00h00m00s00# –.  – e – –  00 . 00M
Tgt : STOP  Now : STOP  Spd : 0
Man : STOP   Sub : 0  VBF : 000  ABF : 00
TrMd : STOP  TrSt : 0  TNo :     Ver : 00
RvMd : STOP  RvSt : 0  DNo :   Aer : 00
CcSt : STOP       Id : 00000000
Stc : 00000000   Tpp-Av1 : +-0  V-A : +-0
MPEG2  720x480 A0 AC-3 2ch 0256k
NT  ASP : 43  CGMS : 0  APS : 0  Src : 0
END : 00h00m00s00                  Cell : 000
```

• Subscreen 2: Error log for VR playback

```
① → G : 01–01   00m00s# –.  – e – –   00000000
            h m s  M e s s a g e            h m s  Err
      G001 : 000000  Tr  : N u l l b l k
② →  L002  : 001230  Tr  : S c h L a t e
      L002  : 004103  Tp : V o b D i f +
      L002  : 004104  Tp : V o b D o f –
```

① Data on location of the display
Original(G)/play list (L), title No., chapter No. (X:XX-XX), time of the display (min, sec, frame [XXmXXsXX]), busy mark of the virtual mechanical-control computer (#), error rate of the transfer data (X.XeXX), playback logical address (ID [XXXXXXXX])

② Error message log
Original(G)/play list (L), title No., time of generation (min, sec [XXX:XXXX]), playback-related error log for the last 13 errors (XX:XXXXXXX)

Notes:
- For details on error messages, see Table 1 "Description of VR-playback-related errors".
- If a VR-playback-related error is generated, a problem in data reading from the disc may be suspected. (The possibility of a problem on the drive side is high.)

• Subscreens 3 and 4:

These subscreens are not for service use.

Table 1: Description of VR-playback-related errors

Error Message	Description
Tr : NullBlk	Transfer task: NULL at the top block (Detecting NG stream made at the DVR-1000 series and starting protection process.)
Tr : ReadErr	Transfer task: ATA read error
Tr : SchLate	Transfer task: ATA search late
Tr : SemTOvr	Transfer task: Timeout for gaining semaphore (no synchronization with the display)
Tr : NaviErr	Transfer task: Inconsistency between NAVI (navigator) of management data and actual NAVI
Tr : OrderEr	Transfer task: Inconsistent order
Mn : Av1Hang	Main task: Detects hang-up of AV decoder and starts recovery
ERR_RCV!	TPP task: Detects hang-up of AV decoder and starts recovery
Tp : VobDif+	TPP task: The decoder STC advances by 1 VOBU hour.
Tp : VobDif-	TPP task: The STC of the management information advances
Tp : midNULL	TPP task: The management information pointer designated was NULL.
Tp : ScanNg	TPP task: Failure to set the TPP memory when scanning was canceled.
Tp : RStepEr	TPP task: Although the reverse step had failed, the operation was forcibly terminated because the top cell was located.
Tp : tppErr	TPP task: Inconsistency occurred.
Rv : 1stTOvr	Reverse playback task: Timeout for waiting for interruption to the top VOBU immediately after starting decoding
Rv : OpnTOvr	Reverse playback task: Timeout for waiting for B-picture of the open GOP immediately after starting decoding
Rv : OpITOvr	Reverse playback task: Timeout for waiting for I-picture of the open GOP immediately after starting decoding
Rv : LnkTOvr	Reverse playback task: Timeout for waiting for link
Rv : LnkFail	Reverse playback task: Starts compensation by detecting link failure
Rv : R2FTOvr	Reverse playback task: Starts retrial after detecting timeout from reverse pause to forward pause
Rv : TopVbEr	Reverse playback task: Forced termination because of a possible error of the top data during reverse normal playback
Rv : OrderEr	Reverse playback task: Inconsistent order
Av : B/CTOvr	AV1: Buffer-clear timeout
Av : StrmOvr	AV1: Timeout for waiting for stream ready
Av : TpmTOvr	AV1: Timeout for TP mode change
Av : SpmTOvr	AV1: Timeout for a step command
CC_OS_ERR	Closed caption task: OS error

Abbreviations:
STC = System Time Clock
VOBU = Video Object Unit
GOP = Group Of Picture
B-picture = Bidirectionally predictive-picture
I-picture = Intra-picture
P-picture = Predictive-picture
TP mode change = AV1 term (Trick Play mode change)

Table 2: Description of VR-recording-related errors

● Error related to MPEG Encoder

Error Message	Description
Stream NG	Inappropriate input stream data
Stm Start NG	Failure to start encoding (reasons not clear)
AVEnc Hang	Inappropriate MPEG encoder
No SysHdr IN	System packet is not input periodically
Strm Start NG	Timeout waiting for system packet input at the beginning
IN Encode *	Changes cannot be made in the process of encoding
EncModul Hang	Encoder routine is hung up.

● Error related to Drive system

Error Message	Description
BUF Overflow	Overflow of the Stream Buffer
Drive Hang	The Drive is hung up.
Write Err	The Drive failed to write and could not be recovered.
Read Err	Reading failed, ECC failed, etc.
Drv Hard Err	Abnormality in the drive hardware or firmware
Mech No Res	No response from the mechanical-control computer
Drv Timeout	Timeout waiting for drive operation
NWA Exhaust	NWA surpassed and impossible to use
MKB Invalid	MKB reading error
Drv Err	General error of the drive
Fail Repair	Repair failed
ReadOnly DISC *	Because some data are invalid, data cannot be written
May Be V mode	AlthoughTMP_VMGI is not written, it may be Video Mode disc.
Rzn Rsv NG	Reserve RZone failed
Rzn Cls NG	Close RZone failed
Rzn Rpr NG	Repair RZone failed
Bdr Opn NG	Open Border failed
Bdr Cls NG	Close Border failed
Format NG	Format failed
OPC NG	OPC failed
PCA Full	PCA has been used up.
RMA Full	RMA has been used up.
VTSI_B Wr Err	Video Mode VTSI BUP Write Error
VTSI Wr Err	Video Mode VTSI Write Error
TMP-VMG WrErr	Video Mode TMP VMGI Write Error
CLS Rzon Fail	Video Mode Close Rzone failure

● Error related to Dubbing

Error Message	Description
Mem get NG	Video Mode Copy Memory has not ensured.
V Rsv RzoneNG	Video Mode Copy Reserve Rzone failed
VCHDD Info NG	Obtaining Video Mode Copy HDD Cell information failed
VC Pck Anl NG	Analizing Video Mode Copy Pack failed
VC VOBU SizeE	Video Mode Copy VOBU Size NG
Tracon Trn NG	Video Mode Copy Tracon tranfer has not been completed.

● Error related to Dubbing (continued)

Error Message	Description
Strm TransfNG	Video Mode Copy Stream Transfer NG
VC FlushC NG	Video Mode Copy Flush Cache NG
VC Transf Stp	Video Mode Copy Transfer Stop
VC CopyCancel	Video Mode Copy Copy Cancel
VC Idling NG	Video Mode Copy idling NG
VC TSO BLK NG	Video Mode Copy TSO Block transfer has not been completed.
VC Cell Max	Maximum number for Video Mode copy Cells exceeded
VC HDD Inf NG	No information on Video Mode Copy HDD
VC HDD C Err	Inappropriate Video Mode Copy HDD content
V2H SRC Prot	VR →HDD copy prohibitted material
V2H Aud Ch NG	VR →HDD Audio Channel NG
V2H Aud Stm N	VR →HDD Audio Stream number NG
V2H Aud Md NG	VR →HDD Audio Mode NG
V2H V Reso NG	VR →HDD Video resolution NG
V2H Unknown	VR →HDD other NG
H2D CP SomeNG	VR →HDD copy and other NG

● Other Errors

Error Message	Description
DRAM NG	Abnormality in access to the Work DRAM
SRAM NG	Abnormality in access to the backup work SRAM
CPRM IC NG	Inappropriate CPRM IC
Drive Destroy	The drive has crashed.
MKB REVOKED	Error in gaining data
WM Cracked	WM Cracked
VBR-SRAM NG	Abnormality in VBR SRAM
BK BATT Down	Backup RAM data has been erased.
BK FSYS Dirty	Backup RAM data has not been wrtten on the File Sys.
VOBU Info NG	Inappropriate VOBU information
Ourob Strm NG	Inappropriate stream data to the Ouroboros input
WaterMark Det	Watermark detected
No Video	No video input (not locked)
Disc Full	No further data can be written because the disc is full.
No More Info *	No more space in the internal work-management area
No Permission *	No permission to write to the disc
Limit Over *	Standard maximum limit exceeded
Rec Pause *	No operation permitted during recording pause
Invalid Param *	Invalid parameter
Protect Src *	Source to be recorded is copy-protected.
Now Busy *	In the process of the emergency processing
Invalid Disc *	The disc cannot be recognized.
Invalid UDF *	Invalid UDF content
Invalid VMG *	Invalid VMG content
Invalid TMVMG	Invalid TMP_VMGI content
Unmatch Stamp *	Impossible to modify because of nonmatching time stamp
Virgin DISC	Virgin Disc

● Other Errors (continued)

Error Message	Description
SW Vpb mode *	Switching to video playback routine is required.
SW Vrec mode *	Switching to video recording routine is required.
NV Pck MK Err	Error in creating NaviPack
NV Pck DMA Er	Inappropriate NaviPack DMA
Cell Close NG	Cell Close NG
Relocation Do	VR-recording data was relocated
Something *	undetermined error
Status NG *	Abnormality in change of statuses
Irr Action *	Incorrect action
Abort *	Cancellation
BusReset Done	Bus Reset has been excecuted.
Repair Excec	Repairing has been executed.
Format Excec	Formatting has been executed.
BUG	Some bugs
PARAM NO ACCP	Recording parameter is not matched.
DRAM CLR Err	Video Mode DRAM (Stream Buffer) Clear failure
V Categ ID NG	Inappropriate Category ID
V Cate Inf NG	Inappropriate Category information
V Ext TY NG	Type NG
V Ext MAX Ovr	Count Max exceeded
V ExtToo Big	The extension file is too large.
Over Heat	Abnormal temperatute

● Error related to HDD

Error Message	Description
HDD unauthor	Inconsistent HDD serial No.
HDD Destroy	HDD is not recognized on the bus.
TT Rec Over	Title recording time full
HDDReset Done	HDD Reset executed
Task No Activ	Task has not been activated.
HDD Buff High	High-level process executed for the HDD Buffer
HDD Trans Err	DMA error in HDD copy transfer
HDD Zero WR	MBR readout generated
HDD Initialize	HDD initialized
HDD MBR NG	Inconsistent MBR data
HDD SIG NG	Inconsistent HDD Management Data Magic
HDD INFO BAD	Incorrect HDD Management Data
HDD IRRG POFF	Abnormal power off
HDD SMART NG	Inappropriate HDD SMART

● No Error

Error Message	Description
Non Err *	Normal

Notes;
- Any error message marked with * is displayed "RecErr : ---------" on the Subscreen 1 of the fourth screen.
- In a case of an error in the drive system, scratches or dirt on a disc, or a problem of the drive itself (dirty pickup) may be suspected.

Abbreviations:
ECC = 4 byte Code for Error Correction
UDF = Universal Disc Format
PCA = Power Calibration Area
OPC = Optical Power Control
NWA = Next Writable Address
VMG = Video Manager
RMA = Recording Management Area
MKB = Media Key Block
TMP_VMGI = Temporary Video Manager Information
Border = from Lead-in to Lead-out

Table 3: List of Key Codes

How to enter each check mode

Test mode remote control unit : [A8**]
Remote control unit supplied with the DVR : [AB**]

No.	Check Item	Key Input	Operation / purpose	Remarks
1	EE system (same as preview)	[ESC] → [A.MON]	Turns on/off EE mode cyclically	Make sure that CGMS = 11 becomes when CGMS = 10 is input. EE mode: Simulation mode for recording status
		[PLAY]	Starts the EE system in EE mode (main-unit setting rate)	
		[STOP]	Stops the EE system in EE mode	
2	Error-rate measurement	[ESC] → [SIDEB]	**V-mode recording:** After recording for 10 seconds, the unit starts playback while displaying the error rate. **DVD-Video:** The error rate is automatically measured, then the result will be displayed.	For details, see " 7.1.4 ERROR RATE MEASUREMENT ".
3	Settings for specific areas	[ESC] → [CHP/TIM]	Enters Adjustment mode for AVIO settings	Settings are made for the selected input (TUNER, LINE). For details, see " 7.1.5 SETTINGS FOR SPECIFIC AREAS ".
		[ESC]	Determines the settings, then exits Adjustment mode	

How the ESC code is processed

- When the ESC code is received, ESCAPE mode is entered, but in combination with the code(s) that follow(s), a specific meaning is added.
- If ESC codes are received continuously, ESCAPE mode is retained.

7.1.5 DV DEBUG MODE

Press the ESC, DISP, then "3" keys, in that order.

```
① (DV/1394) Init:OK AV:01 DV:01          INT4:02

② [Recoder] GUID:00E036000160001 IRM
③ iPCR:C03F0000 oPCR:0000007A
④ [DV]      GUID:0080880303480E96
⑤ VN:VICTOR    MN:GR-D50K
⑥ TM:C3 TS:75 CT:32 WP:01 PS:FF OS:00
⑦ CA:A000002020    CV:FF MD:VTR
⑧ [DVdecoder:Yes]
⑨ TC:00h20m35s02f RD:02/02/05 RT:10h34m50s
⑩ ASPECT:4:3      CGMS:000000 APSTB:00 DEC:525-60
⑪ SF:32kHz QU:12bit AMODE:4) Stereo
⑫ [DVencode:No]
⑬ TC:--h--m--s--f RD:--/--/--/-- RT:--h--m--s
⑭ ASPECT:-------- CGMS:-- APSTB:--
```

Boldface alphanumerics : Fixed indications
Nonboldface alphanumerics : Variable indications

No.	Item	Description	Remarks
①	Init	Whether the initialization of uPD72893B (1394LINK & DVcodec IC) has been completed (OK) or not (NG)	In a case of NG, communication with uPD72893B may have failed.
	AV	Number of AV devices on the local bus	
	DV	Number of DV devices on the local bus	If the number does not become 01 even if a DV device is connected, identification of that device fails.
	INT4	Number of executing INT4(PIO) interrupt processing routines until a POWER ON notification arrives from uPD72893B (normally, 02)	
②	GUID	GUID set in ConfigROM of the unit	In a case of ROOT (IRM), IRM is displayed at the rightmost of the GUID indication
③	iPCR	iPCR value of the unit	
	oPCR	oPCR value of the unit	
④	GUID	GUID set in ConfigROM of the connected DV device	Data are displayed only if one DV device is identified. If the connected DV device is ROOT (IRM), IRM is displayed at the rightmost of the GUID indication
⑤	VN	Vendor name set in ConfigROM of the connected DV device	Data are displayed only if one DV device is identified. (Depending on the device, the vendor name may not be set in ConfigROM.)
	MN	Model name set in ConfigROM of the connected DV device	Data are displayed only if one DV device is identified. (Depending on the device, the vendor name may not be set in ConfigROM.)
⑥	TM	Transport Mode data obtained from the DV device	Data are displayed only if one DV device is identified.
	TS	Transport State data obtained from the DV device	
	CT	Cassette Type data obtained from the DV device	
	WP	Copy-protection data obtained from the DV device	
	PS	Power-state data obtained from the DV device	
	OS	Output signal mode data obtained from the DV device	
⑦	CA	Connect AV data obtained from the DV device	Data are displayed only if one DV device is identified.
	CV	Camera/VTR data obtained from the DV device	
	MD	DV device mode	Camera or VTR is displayed only if one DV device is identified.
⑧	[DVdecode:XXX]	Whether Yes (in the process of requesting DV input) or No is indicated in XXX	Normally, Yes is indicated only when CH is set to DV

No.	Item	Description	Remarks
⑨	TC	Time-code data of the DVdecode Stream, or response data of the Time Code command	Stream time-code data are obtained when playback in the forward direction is performed. Otherwise, time-code data are obtained through an AV/C command.
	RD	Rec Date of DVdecode Stream	
	RT	Rec Time of DVdecode Stream	
⑩	ASPECT	Aspect Ratio of DVdecode Stream	
	CGMS	CGMS of DVdecode Stream (from left to right, CGMS data of bits 5-4: Audio ch2, bits 3-2: Audio ch1, and bits 1-0: Video)	Recording of DV input cannot be performed unless the value of CGMS is 00.
	APSTB	APS trigger bit of DVdecode stream	
	DEC	With/without DVdecode stream input	With input: Signal type (525-60, 625-50, 1125-60, 1250-50, or Invalid) is indicated, Without input: "No" is indicated.
⑪	SF	Sampling Frequency of DVdecode Stream	If SF is 44 kHz, it is considered that 44.1-kHz audio is input, and sound is muted on the unit.
	QU	QUANTIZATION of DVdecode Stream	
	AMODE	AUDIO MODE of DVdecode Stream	
⑫	[DVencode:XXX]	Whether Yes (in the process of requesting DV output) or No is indicated in XXX	Normally, Yes is indicated only with HDD or DVD playback
⑬	TC	TIME CODE of DVencode stream	
	RD	REC DATE of DVencode stream	
	RT	REC TIME of DVencode stream	
⑭	ASPECT	Aspect Ratio of DVencode stream	
	CGMS	CGMS of DVencode stream (common to video, audio ch1 and audio ch2)	Normally, sources other than CGMS=00 are not output.
	APSTB	APS trigger bit of DVencode stream	

■ Simple Diagnosis

Symptoms	Location in the Debug Screen	Items to be Checked, and Conditions	Possible causes
No operation for either DV input or output	①	Check the init indication: OK: Initialization of DV-related LSIs (IC5101, IC5202) appropriately completed NG: Communication failure between DV-related LSIs (IC5101, IC5202) and HOST microcomputer (IC1001). Initialization of DV-related LSIs (IC5101, IC5202) has not been completed properly.	Defective IC, defective soldering, defective power supply, etc.
		Check the number of DV devices when one DV device is connected to the recorder: 01: The connected DV device is correctly identified. Other than 01: The connected DV device is not correctly identified.	Defective DV terminals, improper connection of the DV-terminal board, defective IC, defective cables, an IEEE 1394 device other than the DV device connected
No picture nor sound for DV input	⑦	Check of DV decoding when the recorder channel is set to DV: Yes: The recorder is in the process of a DV input operation No: The recorder is not executing a DV input operation	Defective IC, defective soldering, defective power supply, etc.
	⑨	Check DEC: 525-60: An NTSC DV signal is input from the DV device. 625-50: A PAL DV signal is input from the DV device. No: No DV signal is input from the DV device.	Defective DV terminals, improper connection of the DV-terminal board, defective IC, defective source device **Note:** As to a model having the Input Line System setting, if the setting and the actual input signal system do not match, no picture appears.
DV input recording impossible	⑨	Check CGMS: 00: A copy-permitted source is being input. Other than 00: A copy-protected source is being input.	Recording cannot be performed for a copy-protected source.
No sound for DV input	⑩	Check SF: 32 khz: An audio signal with 32-kHz sampling frequency is being input. 48 khz: An audio signal with 48-kHz sampling frequency is being input. 44 khz: An audio signal with 44.1-kHz sampling frequency is being input.	An audio signal with 44.1-kHz sampling frequency is muted.
No picture nor sound for DV output	⑪	Check DVencode during DVD/HDD playback: Yes: The recorder is in the process of a DV output operation No: The recorder is not executing a DV output operation (No is also displayed during playback of copy-prohibited sources or simultaneous-recording/playback.)	Defective IC, defective soldering, defective power supply, etc.

7.1.6 ERROR RATE MEASUREMENT

How to enter Error-Rate Measurement mode

Press the ESC key then the SIDE-B key of the remote control unit for service to enter Error-Rate Measurement mode. During playback of DVD-VIDEO, Error-Rate Measurement mode can also be entered by pressing the ESC key then the PLAY key.

How to exit Error-Rate Measurement mode

Press the ESC key. The error-rate display disappears, and Error-Rate Measurement mode is exited.

Note: The error rate cannot be measured in VR mode or during CD playback.

Functions

① Video-mode recording (recording medium)

In this mode, DVD recording is automatically performed for 10 seconds, the recorded DVD title is played back while the error rate is being measured, then as soon as playback of the recorded DVD title is finished, playback stops.*1 After error-rate measurement is finished, the average error rate will be displayed on the FL display and OSD. Only in a case in which the calculation of the average error rate fails, the tray will open.

② DVD-VIDEO (playback medium)

Only during playback, when the ESC key then the SIDE-B key (or the ESC key then the PLAY key) are pressed, the error rate is calculated and displayed on the FL display and OSD.(*2) Only in a case in which the calculation of the average error rate fails, the tray will open.

■ Changes of display

Table 1: Video mode (recording medium)

Operation	Display	
	FL Display	OSD (On Screen Display)
"ERROR RATE" is displayed on the FL display for an instant.	ERROR RATE	
DVD recording starts.	ERROR RATE	
DVD recording is performed for 10 seconds.	xxxxx	
The recorded DVD title is played back while the error rate is being measured, then as soon as playback is finished it stops.	ER x.xE-x	ERR RATE : x.xE-x -
After error-rate measurement is finished (*1), the average error rate, the measurement-finish mark (*), and the OK/NG-judgment result (*3) will be displayed on the FL display and OSD. (If the tray opens as a result of NG judgment, the display on the FL display and OSD will be retained.)	ER x.xE-x	ERR RATE : x.xE-x * OK

Table 2: DVD-Video (playback medium)

Operation	Display	
	FL Display	OSD (On Screen Display)
Only during playback, when the corresponding keys are pressed, the error rate is calculated and displayed on the FL display and OSD. (*2)	ER x.xE-x	ERR RATE : x.xE-x -
After error-rate measurement is finished (*1), the average error rate, the measurement-finish mark (*), and the OK/NG-judgment result (*3) will be displayed on the FL display and OSD. (If the tray opens as a result of NG judgment, the display on the FL display and OSD will be retained.)	ER x.xE-x	ERR RATE : x.xE-x - OK

∗1 : Whether error-rate measurement is finished or not is judged, as shown in Table 3 below.

Table 3: On judgment whether error-rate measurement is finished or not

Recording Mode	Judgment whether error-rate measurement is finished or not	Recording/playback duration required for error-rate measurement
Video mode	After playback of a certain amount (∗) of data Measurement of the 16 ECC blocks is performed 16 times, then the grand sum is used for calculation of the error rate. The capacity is as follows: 16 ECC blocks × 16 sectors × 2048 bytes × 16 times = 8388608 bytes = 67108864 bits	The time required for completion of error-rate measurement varies, depending on the input video signal to be recorded. (The more the motion in the input video signal to be recorded is animated, the shorter the playback time required for completion of error-rate measurement becomes.)

∗2 : During DVD-VIDEO error-rate measurement, even after error-rate measurement is finished, playback continues, and the display of the error rate results is retained. In this playback mode, if Error-Rate Measurement mode is exited by pressing the ESC key, then it is reentered by pressing the ESC and SIDE-B keys (or ESC and PLAY keys), the error rate will not be updated, and the previous value is displayed. To reset the previous error rate, stop disc playback.

∗3 : OK/NG judgment
In DVD/VIDEO and Video Mode recording, OK/NG judgment is displayed under the following conditions:

Table 4: List of OK/NG threshold values

Disc Type	Recording Mode	Finalized or not finalized	Reference Value	Display
DVD-VIDEO			8.0×10^{-4}	OK / NG
DVD-R	Video mode	Finalized	1.0×10^{-3}	OK / NG
		Not finalized	1.0×10^{-3}	OK / NG
DVD-RW	Video mode	Finalized	1.0×10^{-3}	OK / NG
		Not finalized	1.0×10^{-3}	OK / NG

7.1.7 VIDEO ADJUSTMENT FOR SPECIFIC AREA

Purposes: Depending on the area, jitter may appear in a picture received by the tuner, as conditions of signals received by the tuner are different from area to area. To correct this kind of problem, the function of the System Codec AVIO control section for adjusting signals received by the tuner can be used.

How to enter setting modes: To enter General Setting mode, press the ESC key then the CHP/TIM key of the remote control unit for service. To enter Specific Channel Setting mode, press the DIG/ANA key in General Setting mode.

How to exit setting modes: Press the ESC key. The setting mode is exited, the OSD disappears.

1. Specific Channel Setting mode

This mode is entered when the DIG/ANA key is pressed in General Setting mode. In this mode, specific settings can be made for up to 12 channels. For channels that do not have specific settings, the settings of General Setting mode are applied.
Display in Specific Channel Setting mode (A picture from the tuner can be viewed using the semitransparent OSD display.)

[Display in Specific Channel Setting mode]

[When specific channel settings have NOT been made]

AVIO Specific Area Mode Ver *.**

Input - [tuner]			
Sync AGC	:	ON	*
Threshold	:	Normal	*
V-Sync Det	:	Normal	*
Std Det	:	Normal	*
HD Err Det	:	Normal	*

→ General Setting data

Individual setting state

Input Channel - [		1CH]
Sync AGC	:	---
Threshold	:	------
V-Sync Det	:	------
Std Det	:	------
HD Err Det	:	------

→ Specific Channel Setting data

[When specific channel settings have been made]

AVIO Specific Area Mode Ver *.**

Input - [tuner]			
Sync AGC	:	ON	*
Threshold	:	Normal	*
V-Sync Det	:	Normal	*
Std Det	:	Normal	*
HD Err Det	:	Normal	*

Individual setting state

Input Channel - [		1CH]
Sync AGC	:	ON
Threshold	:	Auto Threshold Level---[3]
V-Sync Det	:	Normal
Std Det	:	Normal
HD Err Det	:	Normal

* : setting is the default.

- If a channel that does not have specific settings is displayed, the setting figures are displayed as hyphens (--).
  If the setting figures are not displayed as hyphens, those settings have been specifically set even if they are identical to the default settings or those of General Setting mode.
- The channels to be displayed in "Input Channel" are as follows:
  - In a case of line input: L1-L3, DV
  - In a case of tuner input: Received channel (a channel to be set in specific channel settings)

Table 1: Key operations in Specific Channel Setting mode
(effective only during recording/playback stop)

Key	Operation	Setting (∗: Default)	Remarks
DIG/ANA	Switches cyclically between General Setting mode and Specific Channel Setting mode.	–	–
INPUT SELECT, CHANNEL +/– (∗R)	Switches inputs or channels.	–	–
[SIDE A], [SIDE B]	Sets Sync AGC.	ON (∗) / OFF	–
[Rev ×3], [×3 Fwd]	Sets Threshold level.	(∗) Normal Auto Threshold Level Manual Threshold Level Pedestal Level	–
[Rev CHAPTER SKIP] [CHAPTER SKIP Fwd]	Sets Threshold level.	According to the setting of Threshold, the values can be changed within the range mentioned below.	–
		• Normal: The value is fixed, with no display of the value.	–
		• Auto Threshold Level: 0-8 (Default: 0)	–
		• Manual Threshold Level: 0-8 (Default: 0)	–
		• Pedestal Level: 0-8 (Default: 0)	–
[Rev SCAN], [SCAN Fwd]	Sets V-Sync Det.	Normal (∗) / Short / Long	–
[Rev STILL STEP], [STILL STEP Fwd]	Sets Std Det.	Normal (∗) / Non STD	–
[SPEED +], [SPEED -]	HD Err Det	Normal (∗) / Fast / Stop	–
PLAY	All channels assigned to have specific settings are canceled, and the specific settings are reset to their default values.	–	Settings of General Setting mode are not affected.
CLEAR	Initializes the setting of Specific Channel Setting mode.	–	Pressing the key resets the settings of Specific Channel Setting mode for that channel to the initial values. Settings of General Setting mode are not affected.
PAUSE	The specific-setting data for the currently selected channel are reset to their default values. (But the assignment of a channel having specific settings is not canceled.)	–	Settings of General Setting mode are not affected (retained).
ESC	Exits AVIO setting for specific areas, clearing the OSD.	–	–

∗R: Refers to keys on the remote control unit supplied with this unit. The keys without "R" refer to the remote control unit for service.

- Screen display when Specific Channel settings are made on 12 (maximum) channels: In such a case. If a channel which does not have specific settings is selected, the individual setting state for that channel is not displayed, as shown in the figure below, and the settings cannot be modified. In such a case, if you wish to make Specific Channel Settings for the currently selected channel, you must clear the Specific Channel Settings for one or more channels beforehand.

[With 12 channels having specific settings, when the currently selected channel does not have specific settings]

```
AVIO Specific Area Mode
Input - [ TUNER ]
Sync AGC        :  ON        *
Threshold       :  Normal    *
V-Sync Det      :  Normal    *
Std Det         :  Normal    *
HD Err Det      :  Normal    *

Individual setting state
  Sorry !
You can store only 12 channels
for Specific Area mode.
```

2. General Setting mode

This mode can be entered only during recording/playback stop. In this mode, each item and its current settings are displayed on the OSD. The currently selected input mode (TUNER or LINE) is displayed. If L1, L2, L3 or DV is selected for input, general settings for the line input can be made, and if TUNER is selected, general settings for the tuner input can be made.

[General Setting mode] (*2)

```
AVIO Specific Area Mode
Input - [ tuner ]
Sync AGC        :  ON        *
Threshold       :  Normal    *
V-Sync Det      :  Normal    *
Std Det         :  Normal    *
HD Err Det      :  Normal    *
```

* : setting is the default.

Table 2: Key operations in General Setting mode (effective only during recording/playback stop)

Key	Operation	Setting (∗: Default)	Remarks
INPUT SELECT, CHANNEL +/– (∗R)	Switches inputs or channels.	–	–
[SIDE A], [SIDE B]	Sets Sync AGC.	ON (∗) / OFF	–
[Rev ×3], [×3 Fwd]	Sets Threshold level.	(∗) Normal Auto Threshold Level Manual Threshold Level Pedestal Level	–
[Rev CHAPTER SKIP] [CHAPTER SKIP Fwd]	Sets Threshold level.	According to the setting of Threshold, the values can be changed within the range mentioned below.	–
		• Normal: The value is fixed, with no display of the value.	–
		• Auto Threshold Level: 0-8 (Default: 0)	–
		• Manual Threshold Level: 0-8 (Default: 0)	–
		• Pedestal Level: 0-8 (Default: 0)	–
[Rev SCAN], [SCAN Fwd]	Sets V-Sync Det.	Normal (∗) /Short/Long	–
[Rev STILL STEP], [STILL STEP Fwd]	Sets Std Det.	Normal (∗) /Non STD	–
[SPEED +], [SPEED -]	HD Err Det	Normal (∗) /Fast/Stop	
CLEAR	Initializes the setting of General Setting mode.	–	Pressing the key resets all settings of General Setting mode to the initial values. Settings of Specific Channel Setting mode are not affected (they are retained).
ESC	Exits AVIO setting for specific areas, clearing the OSD.	–	–

∗R: Refers to keys on the remote control unit supplied with this unit. The keys without "R" refer to the remote control unit for service.

∗1 : In General Setting mode, if the channel displayed has specific settings, the following will be displayed.

[Display in General Setting mode when the channel currently displayed has specific settings]

```
AVIO Specific Area Mode  Ver*.**
Input - [tuner ]
Sync AGC       :  ON        *
Threshold      :  Normal    *
V-Sync Det     :  Normal    *
Std Det        :  Normal    *
HD Err Det     :  Normal    *

    This channel is set up
    individually.
```

7.1.8 AGING MODE

Notes:
Commands from the remote control unit are accepted during Aging mode.
If Aging mode is quit using the ESC key, indications on the FL display will return to normal display.
Cancel timer settings before entering Aging mode.
Set the recording rate beforehand. It cannot be changed during Aging mode.

*** Be aware that all recorded data are deleted when the aging for the DVD-RW and HDD is executed.**

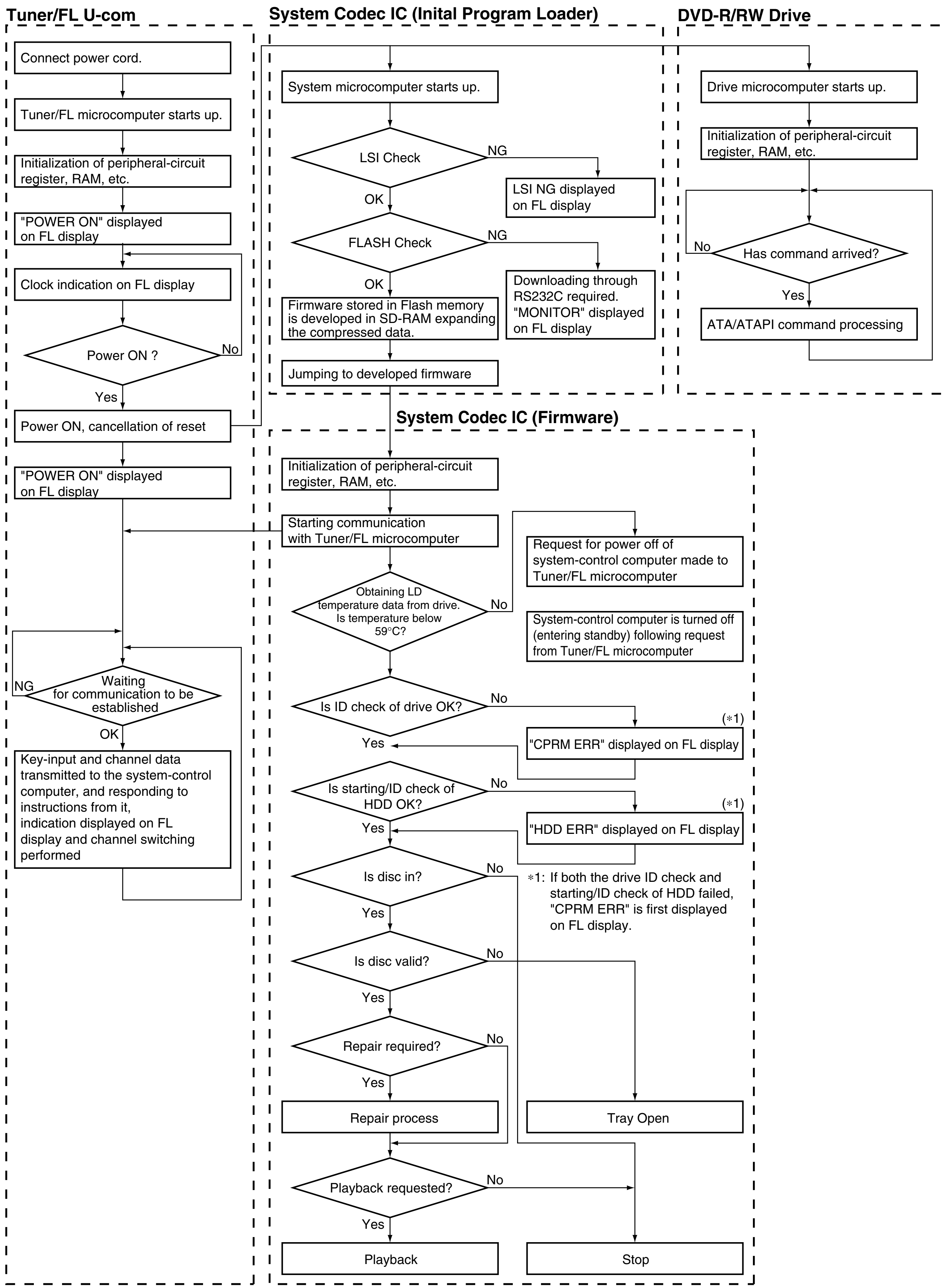
Table 1: Aging for the DVD-RW and DVD-R

	Aging for the DVD-RW	Aging for the DVD-R
To enter Aging mode	Press the DVD key to switch to DVD. Install a recordable DVD-RW disc. After disc detection, press the ESC key then the REP.B key on the remote control unit for servicing to enter Aging mode.	Press the DVD key to switch to DVD. Install a recordable DVD-R disc. After disc detection, press the ESC key then the REP.B key on the remote control unit for servicing to enter Aging mode.
To quit Aging mode	Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode. This also results in the following: • If during recording: Recording is stopped. • If during playback: Playback is paused. • If during initialization: The unit stops after initialization is finished. • If the tray is being opened/closed: The unit stops after the tray is opened/closed.	Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode. This also results in the following: • If during recording: Recording is stopped. • If during playback: Playback is paused.
Function	During Aging mode, the following operations are repeated in the order shown below. ① The tray opens. ② The tray closes. ③ Initialization ④ Recording for 60 minutes ⑤ Playback for 45 minutes ③ Initialization is performed according to the setting specified in "DVD-RW automatic initialization" (accessed by selecting "Unit Setting" then "Option"). During Aging, the number of loops is indicated on the FL display, as shown below. [AGING 0001] If an error is generated, the aging operation stops. **Note:** Indications on the FL display are retained, and this information is also retained as an OSD.	During Aging mode, the following operations are repeated in the order shown below. ① The tray opens. ② The tray closes. ③ Recording for 1 minute ④ Recording pause for 6 minutes ⑤ Recording stops. ⑥ Playback for 1 minute ⑦ Playback pause for 6 minutes ⑧ Playback stops. **Note:** A continuous test of the above operations is possible for approximately 23 hours. After ② the tray closes, disc detection is performed, and if 99 titles have already been registered, the unit stops there. The number of loops is retained and indicated on the FL display. An error indication is retained as an OSD. During Aging, the number of loops is indicated on the FL display, as shown below. [AGING 0001] If an error is generated, the aging operation stops. **Note:** Indications on the FL display are retained, and this information is also retained as an OSD. **Note:** Recording time depends on the recording rate set. For example, if the recording rate is MN32, only up to 60 titles can be registered. Check the setting for recording rate before performing aging.

Table 2: Aging for the HDD

	Aging for the HDD
To enter Aging mode	Press the HDD key to switch to HDD. Press the ESC key then the REP.B key on the remote control unit for servicing to enter Aging mode.
To quit Aging mode	Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode. This also results in the following: • If during recording: Recording is stopped. • If during playback: Playback is paused. • If during erasure of all memory data from the HDD, the unit stops after all memory data have been erased.
Function	During Aging mode, the following operations are repeated in the order shown below. ① Erasure of all the memory data from the HDD ② Recording for 60 minutes ③ Playback for 60 minutes During Aging, the number of loops is indicated on the FL display, as shown below. [AGING 0001] If an error is generated, the aging operation stops. **Note:** Indications on the FL display are retained, and this information is also retained as an OSD.

7.1.9 SETUP SEQUENCE



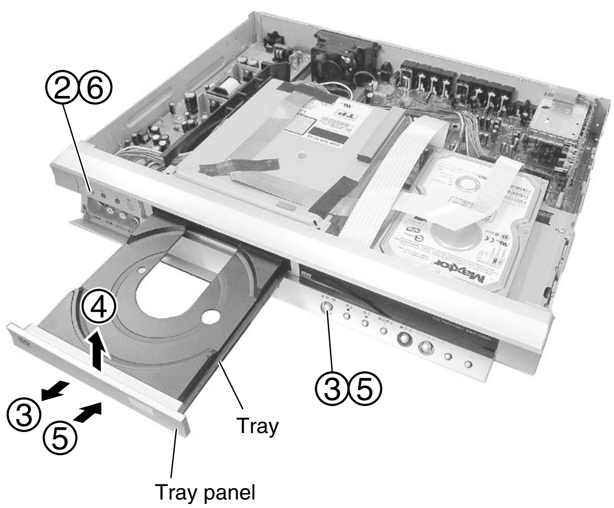
7.1.10 DISASSEMBLY

Note 1 : Even if the unit shown in the photos and illustrations in this manual may differ from your product, the procedures described here are common.
Note 2 : For performing the diagnosis shown below, the following jig cable for service is required:
• GGD1370 (Flexible cable)

Diagnosis of the MAIN Assy

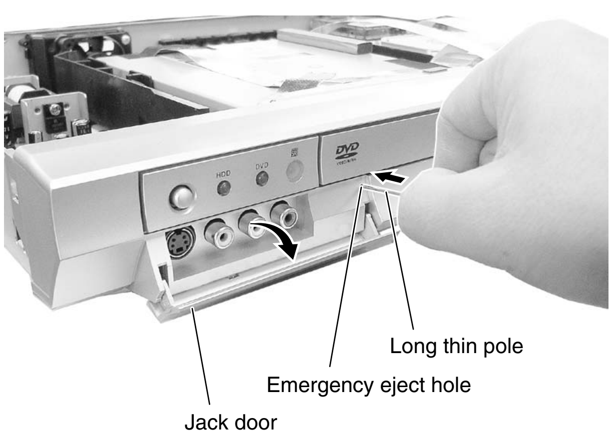
1 Bonnet Case S and Tray panel

① Remove the bonnet case S by removing the eight screws.
② Press the ⏻ STANDBY/ON button to turn on the power.
③ Press the ▲ OPEN/CLOSE button to open the tray.
④ Remove the tray panel.
⑤ Press the ▲ OPEN/CLOSE button to close the tray.
⑥ Press the ⏻ STANDBY/ON button to turn off the power.



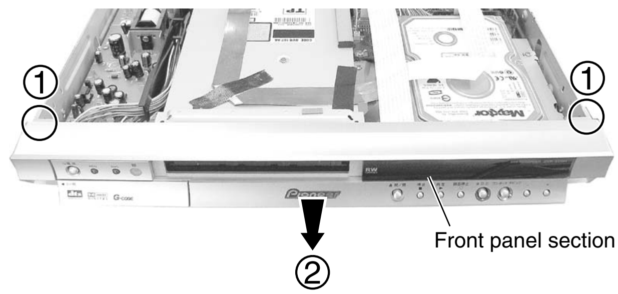
● How to open the tray when the power cannot be on

When the player cannot eject disc tray due to power failure or any other reasons, open the jack door, and use a long thin pole and push the emergency eject hole under the tray panel to eject.



2 Front panel section

① Unhook the four hooks.
② Remove the front panel section.

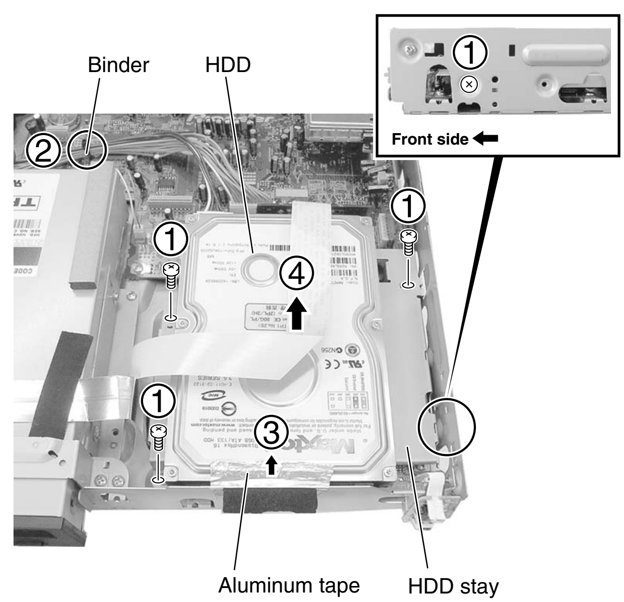




• **Bottom view**

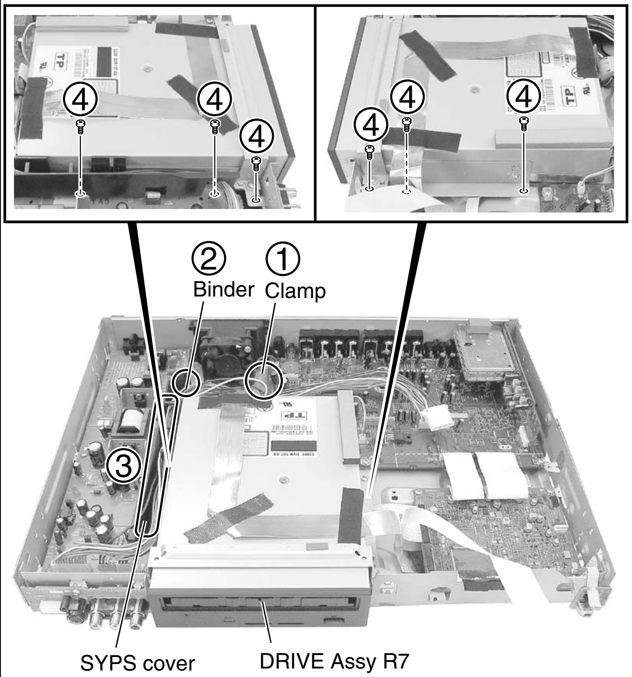
3 HDD Section

① Remove the four screws.
② Remove the binder.
③ Remove the aluminum tape.
④ Remove the HDD with HDD stay.

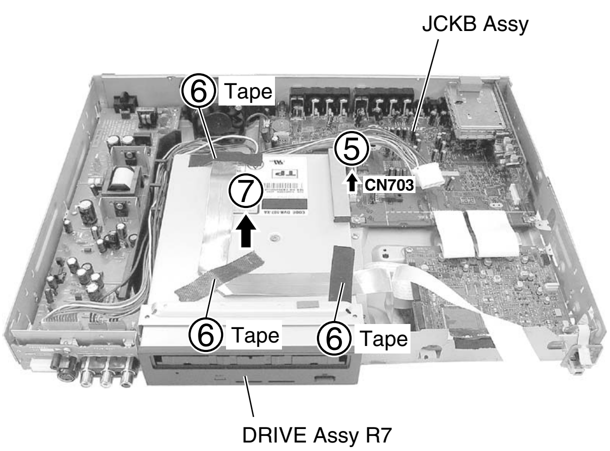


4 DRIVE Assy R7 (DVD-R/RW WRITER)

① Remove the some jumper wires from the clamp.
② Remove the binder.
③ Remove the some jumper wires from the SYPS cover.
④ Remove the six screws.

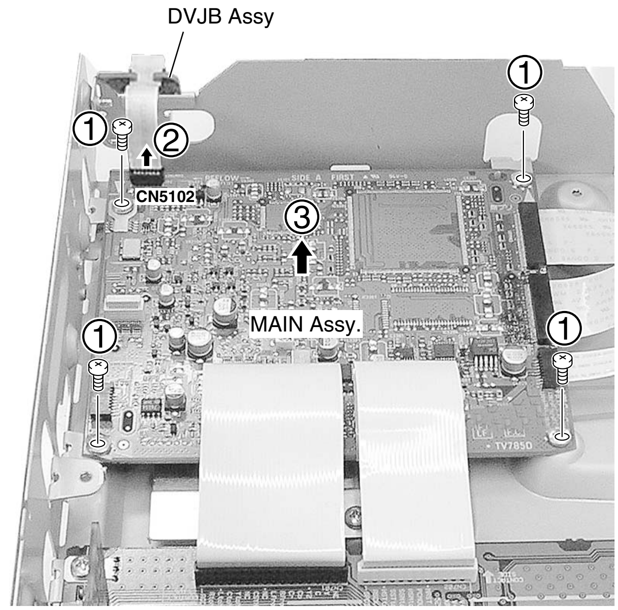


⑤ Disconnect the connector.
⑥ Remove the three tapes.
⑦ Remove the DRIVE Assy R7.



5 MAIN Assy

① Remove the four screws.
② Disconnect the flexible cable.
③ Stand the MAIN Assy.



Note : This photograph may show a different model.
However, the method for disassembly is the same.

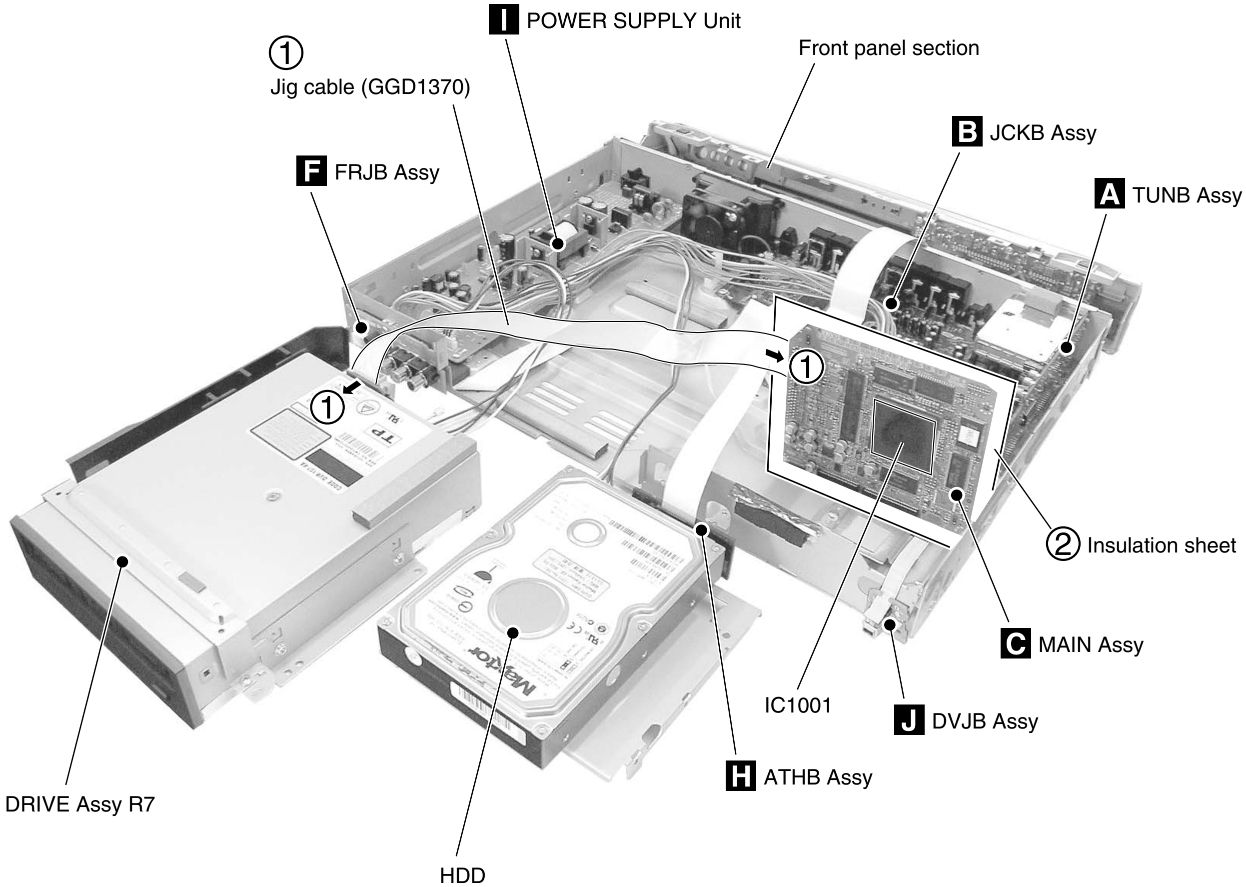
6 Diagnosis

① Connect the jig cable.

② Insert the insulation sheet between the MAIN Assy and base chassis.

③ Arrange the unit as shown in the photo below.

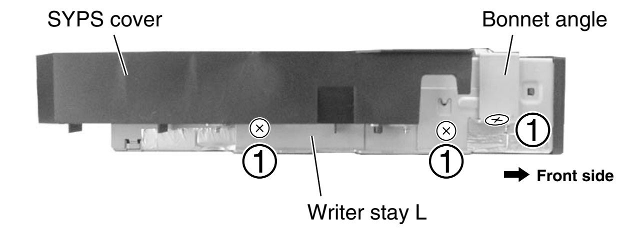
Caution :
Main IC (IC1001) on the MAIN Assy generate heat to arround 80 degrees.
Be careful when works.



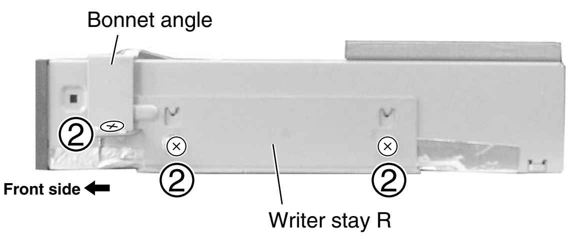
Diagnosis

Cleaning the pickup lens

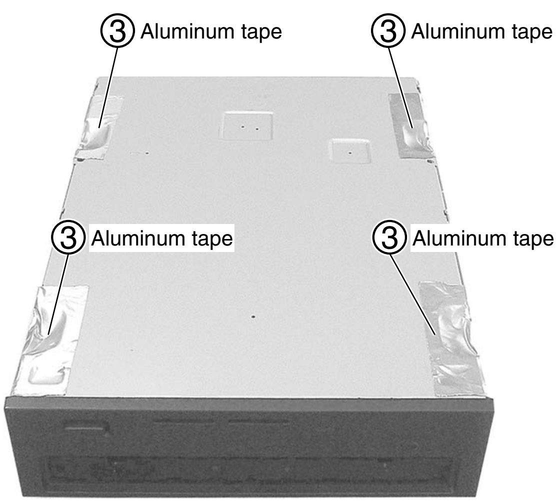
① Remove the writer stay L by removing the three screws with the bonnet angle and the SYPS cover.



② Remove the writer stay R by removing the three screws with the bonnet angle.

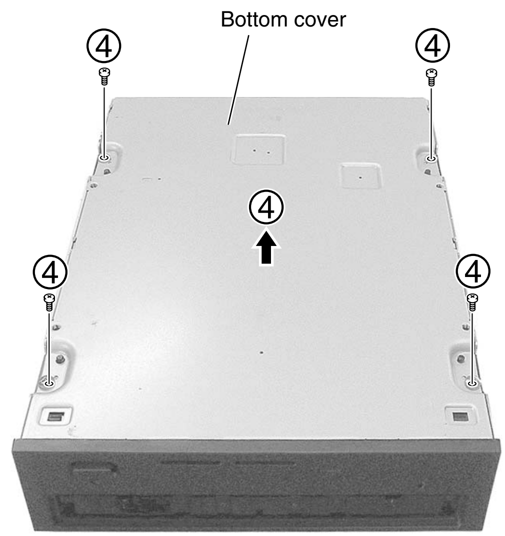


③ Remove the four aluminum tapes.



● **Bottom view**

④ Remove the bottom cover by removing the four screws.

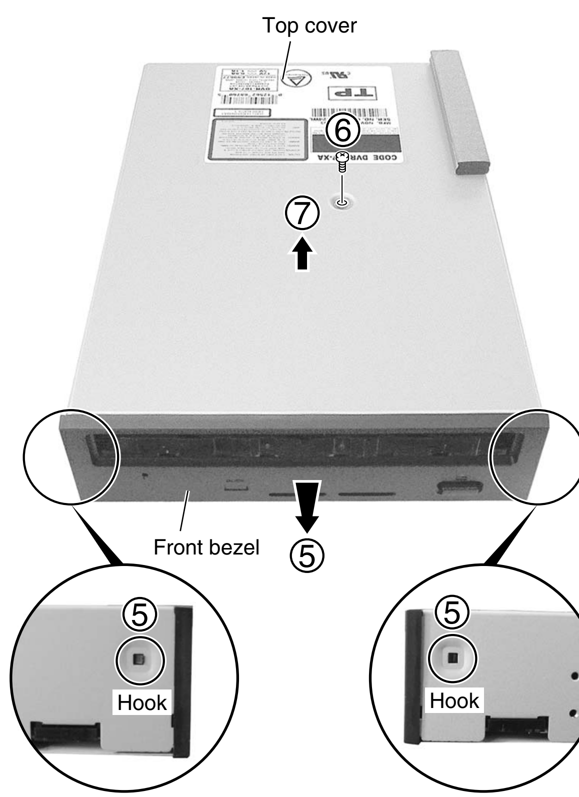


● **Bottom view**

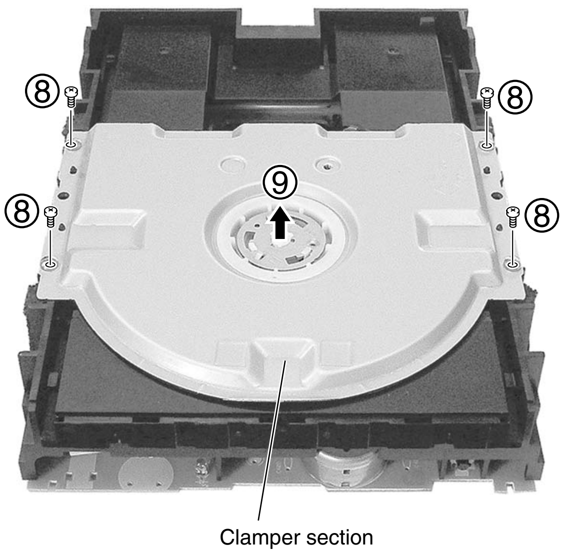
⑤ Remove the front bezel by unhooking the two hooks.

⑥ Remove the one screw.

⑦ Remove the top cover.



⑧ Remove the four screws.
⑨ Remove the clamper section.

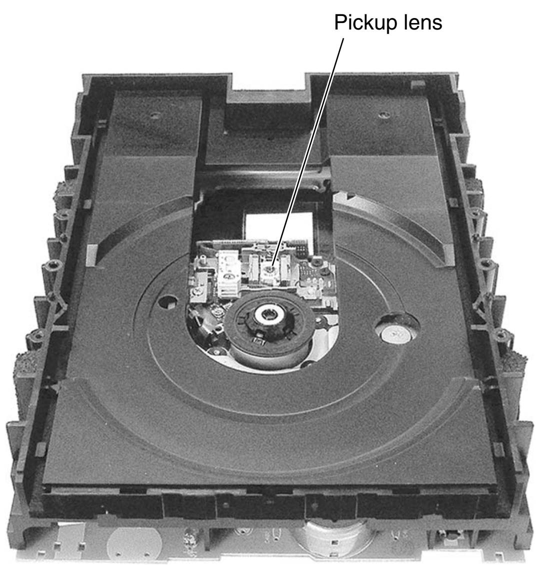


⑩ Clean the pickup lens.



Before shipping out the product, be sure to clean the following positions by using the prescribed cleaning tools :

Cleaning liquid : GEM1004
Cleaning paper : GED-008



7.2 IC

• The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

● **List of IC**

PEG034B, RS5C372A, LC75342M, LA73033M, AK5357VT, PST3428U, PST3809U, M65672WG-C, UPD72852AGB-8EU, UPD72893AGD-LML

■ PEG034B (JCKB ASSY : IC202)

• TUFL Microcomputer

● **Pin Function**

No.	Pin Name	Signal Name	I/O	Function	Active
1	P95/ANEX0/CLK4	FLCLK	O	FL Driver communication line CLK	–
2	P94/DA1/TB4in	SYNC	I	C-Sync of input video	↑
3	P93/DA0/TB3in	AVLINKIN	I	Input line of NexTViewLink	–
4	P92/TB2in/Sout3	IR	I	Pulse input of remote control	–
5	P91/TB1in/Sin3	J_CLOCK	I		
6	P90/TB0in/CLK3	SYNCAFT	I	C-Sync of input video	↑
7	BYTE	BYTE	I		
8	CNVss	PGM	I	Communication line	
9	P87/XCin	NC	(O)		–
10	P86/XCout	NC	(O)		–
11	-RESET	XRESETIN	I	u-Con Reset	
12	Xout	XOUT	I		
13	Vss	GND	–		
14	Xin	XIN	I		
15	Vcc	VCC	–		
16	P85/-NMI	NMI	I		↓
17	P84/-INT2	NC	I		
18	P83/-INT1	SLICEONFB	I	Feedback from SLICEON pin	↑ ?
19	P82/-INT0	XINTRA	I	Alarm/interval interruption	↓
20	P81/TA4in	LED HDD	O	for HDD Model	H
21	P80/TA4out	LED DVD	O	for HDD Model	↑↓
22	P77/TA3in	NC	(O)		–
23	P76/TA3out	FANPWM	O	FAN power control	H
24	P75/TA2in	JOGB	I	Phase VOL input	↑↓
25	P74/TA2out	NC	(O)		–
26	P73/-CTS2/-RTS2/TA1in	IICRST	O		
27	P72/CLK2/TA1out	AVLINKOUT	O		
28	P71/RxD2/SCL/TA0in/TB5in	SCL	I/O	I2C communication (clock)	–
29	P70/TxD2/SDA/TA0out	SDA	I/O	I2C communication (data)	–
30	Vss2	GND	–		
31	LP2	LP2	O		
32	LP3	LP3	O		
33	LP4	LP4	O		
34	Vdd2	VDD2	–		
35	M2	M2	I	Mode switch	
36	M1	M1	I		
37	P11/SLICEON	SLICEON	O	Slicer operating signal	H?
38	P67/TxD1	TXD	O	Communication line for firmware download/monitor	–
39	P66/RxD1	RXD	I	Communication line for firmware download/monitor	–
40	P65/CLK1	SCLK	(O)	Communication line for firmware download/monitor	–

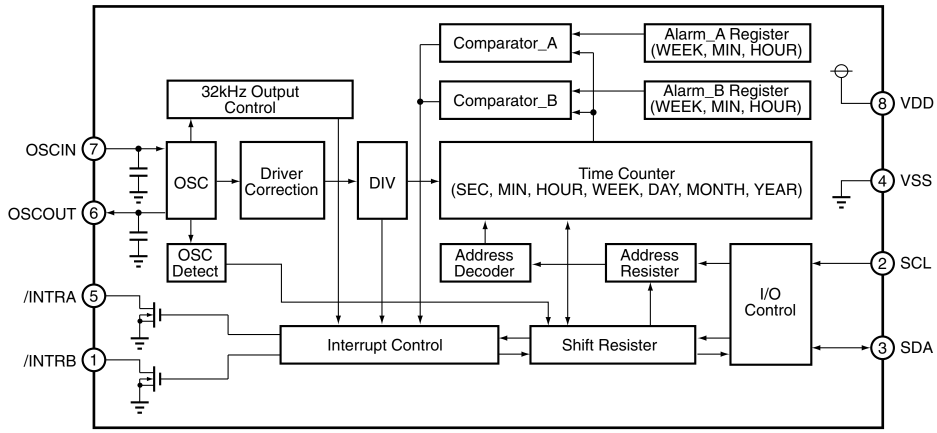
No.	Pin Name	Signal Name	I/O	Function	Active
41	P64/-CTS1/-RTS1/CLKS1	BUSY	O	Communication line for firmware download/monitor	–
42	P63/TxD0	SSTTOM	O	SYS controller communication line (Tuner → Main)	–
43	P62/RxD0	SSMTOT	I	SYS controller communication line (Main → Tuner)	–
44	P61/CLK0	SCK	I	SYS controller communication line (clock)	↑
45	P60/-CTS0/-RTS0	HSTTOM	O	Tuner → SYS handshake	L
46	P57/-RDY/CLKout	DLCONT	O	Voltage supply SW of FLASH-ROM writing	L
47	P56/ALE	WRT	O	Write signal	H
48	P55/-HOLD	SDAEEP	I/O	SDA line for EEPROM	–
49	P54/-HLDA	SCLEEP	O	SCL line for EEPROM	–
50	P53/BCLK	VOLCE	O	Communication line CE	H
51	P52/-RD	VOLDATA	O	Communication line DATA	–
52	P51/-WRH/-BHE	VOLCLK	O	Communication line CLK	–
53	P50/-WRL/-WR	DLCE	I	Signal for serial I/O mode selection	–
54	P47/-CS3	S1	O		
55	P46/-CS2	LET	O	Letterbox signal add	H
56	P45/-CS1	SQU	O	Squeeze signal add	–
57	P44/-CS0	BLANK	I		
58	P43/A19	XTHROU	O		
59	P42/A18	NC	(O)		–
60	P41/A17	NC	(O)		–
61	P40/A16	SWVION	O	Independent source SW for video I/O output circuit	H
62	P37/A15	SWSTBY	O	Standby mode of video input selector	H
63	P36/A14	NC	(O)		
64	P35/A13	NC	(I)		
65	P34/A12	SCTHRU	O		
66	P33/A11	NC	(I)		
67	P32/A10	SDET3	I	S terminal detection of Video input 3	L
68	P31/A9	SDET2	I	S terminal detection of Video input 2	L
69	Vcc	VCC	–		
70	P30/A8	SDET1	I	S terminal detection of Video input 1	L
71	Vss	GND	–		
72	P27/A7	NC	(O)		–
73	P26/A6	NC	(O)		–
74	P25/A5	NC	(O)		–
75	P24/A4	NC	(O)		–
76	P23/A3	P_SAVEBS	O		
77	P22/A2	FOMO	O		–
78	P21/A1	M1ONTA	O		–
79	P20/A0	P_CONT	O	System Power ON	H
80	P17/D15/-INT5	NC	(O)		–

No.	Pin Name	Signal Name	I/O	Function	Active
81	P16/D14/-INT4	HSMTOT	I	SYS → Tuner handshake	↓
82	P15/D13/-INT3	DCTRI	I		
83	P14/D12	MUTE	O	MUTE control	H
84	P13/D11	SU/SAPID	I	SAP detection	H
85	P12/D10	ST/STID	I	Stereo detection (STID)	H
86	P11/D9	XRESET	O	System Reset output	L
87	P10/D8	LDASH	O		
88	P07/D7	STBYQ	O		
89	P06/D6	LM/	O		
90	P05/D5	I/BG	O		
91	P04/D4	XP_SAVE	O		
92	P03/D3	TUON	O	Tuner power	H
93	P02/D2	YCSW	O		
94	P01/D1	RSTCTL	O	Reset signal mask from the system controller	L
95	P00/D0	FLPON	O	FL Driver Power ON	H
96	P107/AN7/-KI3	MODEL1	A/D IN	Input for destination judgment	–
97	P106/AN6/-KI2	MODEL2	A/D IN	Input for destination judgment	–
98	P105/AN5/-KI1	AGC	A/D IN	Field intensity detection	–
99	P104/AN4/-KI0	FUNC	A/D IN		
100	P103/AN3	KEY2	A/D IN	Main unit key input	–
101	P102/AN2	KEY1	A/D IN	Main unit key input	–
102	P101/AN1	NC	–		
103	Avss	GND	–		
104	P100/AN0	AFT	A/D IN	AFT voltage input	–
105	VREF	VREF	–		
106	AVcc	AVCC	–		
107	P97/-ADTRG/Sin4	FLSTB	O	Communication line strobe of FL driver	L
108	Vdd1	VDD1	–		
109	SYNCIN	SYNCTEXT	I	Video input for sync. sep.	
110	SVREF	SLICE	I	Slice level input	
111	Vss1	GND	–		
112	Vdd3	VDD3	–		
113	CVIN1	CVIN1	I	Video input for teletext	
114	Vss3	GND	–		
115	FSCIN	FSCIN	I	Fsc input	
116	P96/ANEX1/Sout4	FLDATA	O	Communication line data of FL driver	–

RS5C372A (JCKB ASSY : IC203)

• Real Time Clock IC

Block Diagram



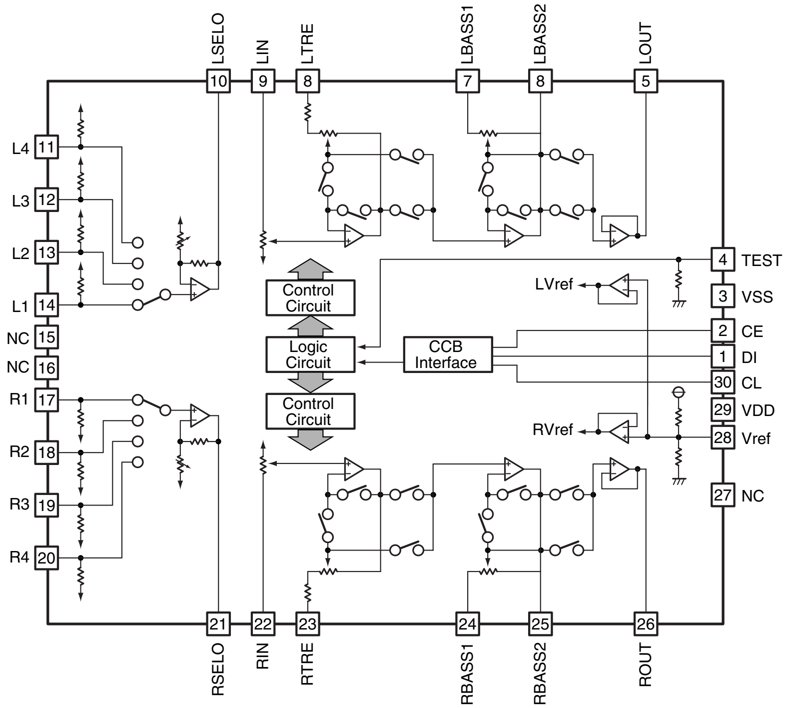
Pin Function

No.	Pin Name	I/O	Function	
1	/INTRB	O	Interruption output B The output of 32.768kHz (in 32768Hz crystal use), cycled interrupt for CPU, or output alarm interrupt (ALARM_B). This pin output 32.768kHz when activated power from 0V. Nch open drain output.	
2	SCL	I	Shift clock input Synchronize with this clock, and input and output data from a SDA terminal. Exceed VDD, and can input to 6V.	
3	SDA	I/O	Serial input and output Synchronize with SCL, and input and output writing data or readout data. Exceed VDD, and can input to 6V. Nch open drain output in the output.	
4	VSS	–	Ground pin	
5	/INTRA	O	Interruption output A Cycled interrupt for CPU, or output alarm interruption (ALARM_A, ALARM_B). This pin becomes an OFF state when activated power from 0V. N ch open drain output.	
6	OSCOUT	O	Oscillation circuit output	Connect a crystal resonator of 32.768kHz or 32.000kHz between OSCIN and OSCOUT, and constitute oscillation circuit. (component parts of oscillation circuit except crystal resonator have it built-in.)
7	OSCIN	I	Oscillation circuit input	
8	VDD	–	Positive supply input	

LC75342M (JCKB ASSY : IC601)

• Electric Volume IC

● Block Diagram



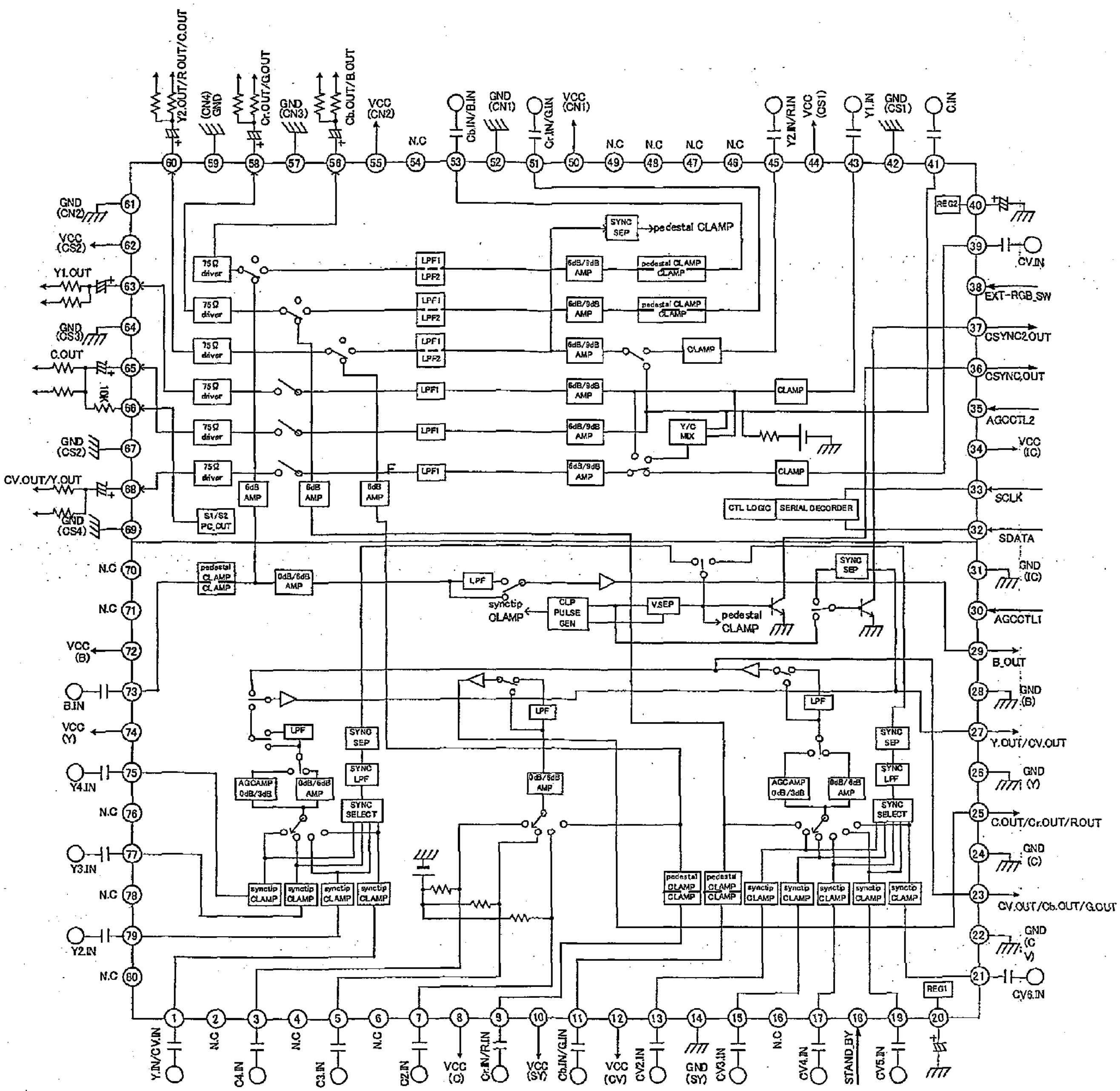
● Pin Function

No.	Pin Name	Function	No.	Pin Name	Function
1	DI	Serial data input for control	16	NC	Not connected
2	CE	Chip enable pin Data are written in the internal latch by a timing of "H" → "L", and each analog switch works. Data transfer is enabled by "H" level.	17	R1	Input signal pin
3	VSS	Ground pin	18	R2	
4	TEST	Pin for electronic volume test Set to VSS electric potential.	19	R3	
5	LOUT	Volume and equalizer output pin	20	R4	
6	LBASS2	Capacitor and resistor connection pins for bus bandpass filter	21	RSELO	Input selector output pin
7	LBASS1		22	RIN	Volume and equalizer input pin
8	LTRE	Capacitor connection pin for treble bandpass filter	23	RTRE	Capacitor connection pin for treble bandpass filter
9	LIN	Volume and equalizer input pin	24	RBASS1	Capacitor and resistor connection pins for bus bandpass filter
10	LSELO	Input selector output pin	25	RBASS2	
11	L4	Input signal pins	26	ROUT	Volume and equalizer output pin
12	L3		27	NC	Not connected
13	L2		28	Vref	0.5XVDD voltage generation block
14	L1		29	VDD	Power supply pin
15	NC	Not connected	30	CL	Clock input pin for control

LA73033M (JCKB ASSY : IC701)

• Video selector and Video driver

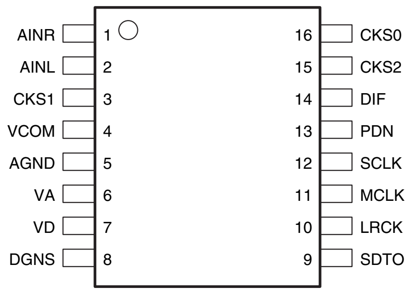
● Block Diagram



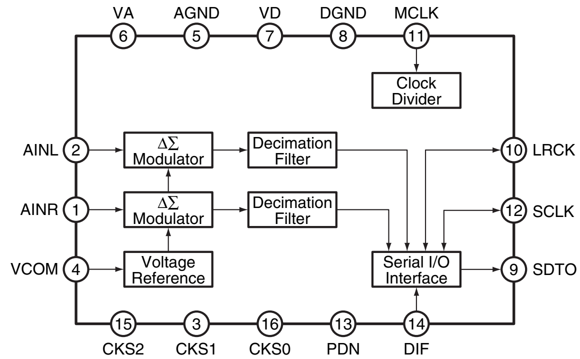
AK5357VT (MAIN ASSY : IC3101)

• 96kHz 24 bit ΔΣ ADC

● Pin Arrangement (Top view)



● Block Diagram

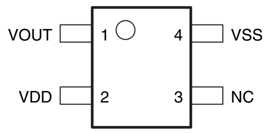


● Pin Function

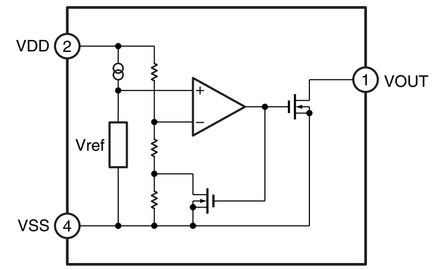
No.	Pin Name	I/O	Function
1	AINR	I	R ch analog input
2	AINL	I	L ch analog input
3	CKS1	I	Mode select 1
4	VCOM	O	Common voltage output, bias voltage of VA/2 and ADC input
5	AGND	–	Analog ground
6	VA	–	Analog power supply, 2.7V to 5.5V
7	VD	–	Digital power supply, 2.7 to 5.5V (fs = 4k to 48kHz), 3.0 to 5.5V (fs = 48k to 96kHz)
8	DGND	–	Digital ground
9	SDTO	O	Audio serial data output, outputs "L" in the power down mode.
10	LRCK	I/O	Channel clock I/O, outputs "L" by master mode in the power down mode.
11	MCLK	I	Master clock input
12	SCLK	I/O	Audio serial data clock, outputs "L" by master mode in the power down mode.
13	PDN	I	Power down mode "H": power up, "L": power down
14	DIF	I	Audio interface format, "H" : 24 bit I2S compatibility, "L" : 24 bit MSB justify
15	CKS2	I	Mode select 2
16	CKS0	I	Mode select 0

PST3428U (MAIN ASSY : IC4003)
• Reset IC

● Pin Arrangement (Top view)



● Block Diagram

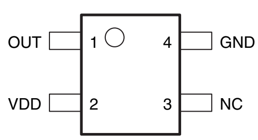


● Pin Function

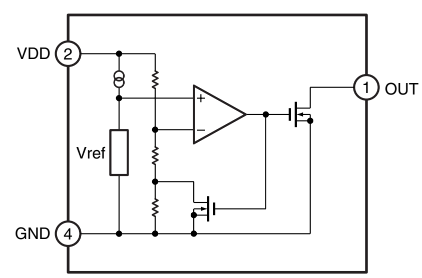
No.	Pin Name	Function
1	VOUT	Reset signal output
2	VDD	Power supply / voltage detection
3	NC	Not connected
4	VSS	VSS

PST3809U (MAIN ASSY : IC4005)
• Reset IC

● Pin Arrangement (Top view)



● Block Diagram



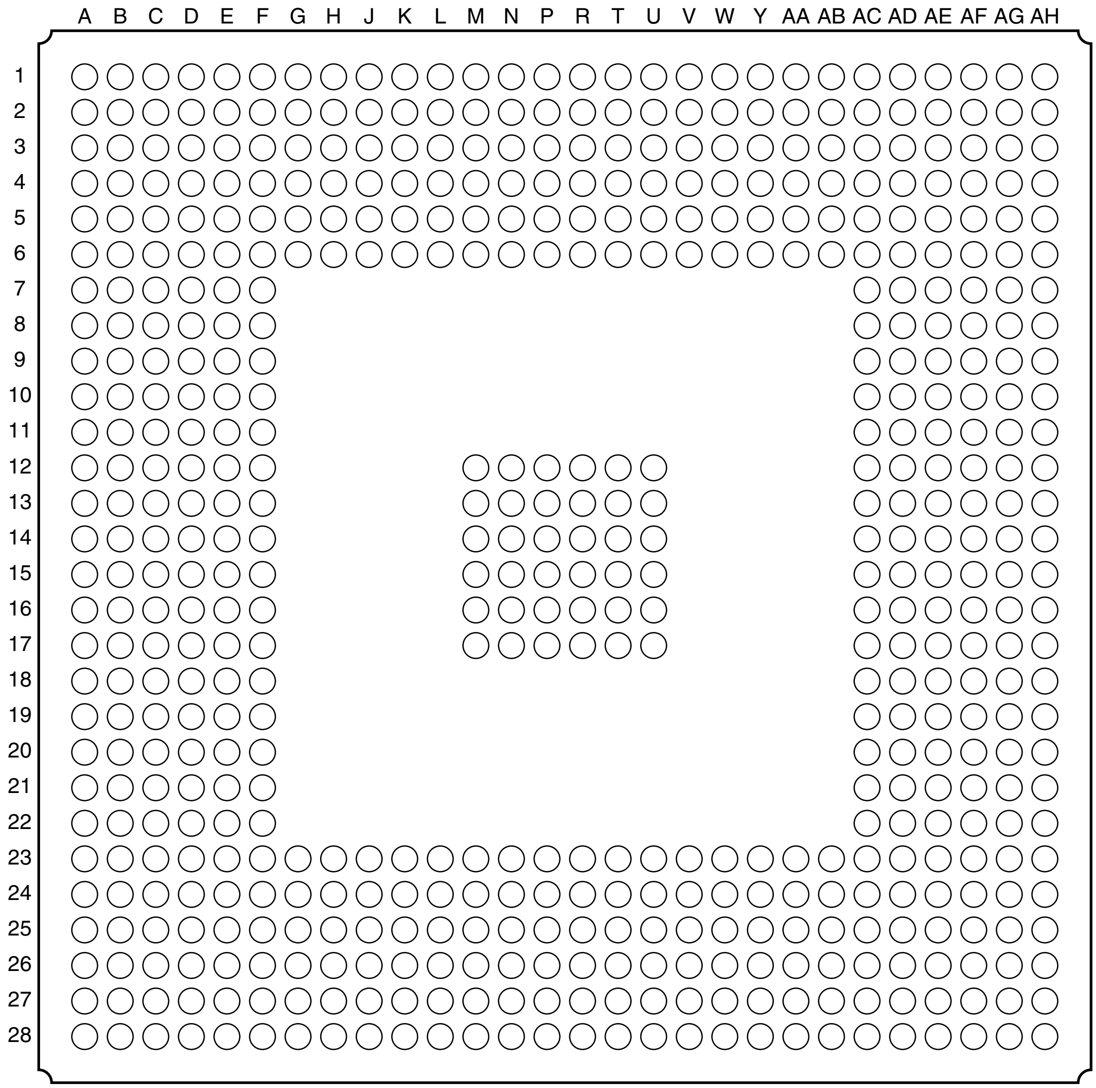
● Pin Function

No.	Pin Name	Function
1	OUT	Reset signal output
2	VDD	Power supply / voltage detection
3	NC	Not connected
4	GND	Ground

M65673WG-A (MAIN ASSY : IC1001)

• Signal Processing IC for DVD Recorder

● Pin Arrangement (Top view)



● I/O buffer list

Buffer Name	Main Function	Remarks
PDIDGZ	Input buffer (5V tolerant)	
PDUDGZ	Input buffer (5V tolerant), pull-up	
PDDDGZ	Input buffer (5V tolerant), pull-down	
PDO04CDG	Output buffer, 4mA	
PDO08CDG	Output buffer, 8mA	
PDO0204DGZ	Output buffer, 2/4mA	
PDO0406DSGZ	Output buffer, 4/6mA	For SDRAM IF
PDO0406DSGZ×2	Output buffer, 8/12mA	For SDRAM IF
PDT0204DGZ	3 state output buffer, 2/4mA	
PDB04DGZ	Bidirectional buffer, 4mA	
PDB08DGZ	Bidirectional buffer, 8mA	
PDB0204DGZ	Bidirectional buffer, 2/4mA	
PDB0406DSGZ	Bidirectional buffer, 4/6mA	For SDRAM IF

● Pin Name list

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	Y	AA	AB	AC	AD	AE	AF	AG	AH	
28	VDD	EDATA[23]	EDATA[22]	EDATA[20]	EDATA[18]	EDATA[16]	EADRS[0]	EBS[0]	ERAS	EDQM	EDATA[6]	EDATA[3]	EDATA[0]	AVDDAD8	BG8	VRB8	AVDDAD8	VRM10	AVDDAD10	PACKETEN	WM2DTO[2]	VDD	WMCLKO	WM1DTO[4]	WM1DTI[1]	WM1DTI[3]	HKEYPLS	VDD	28
27	AT1DATA[12]	EDATA[24]	EDATA[25]	EDATA[21]	EDATA[19]	EDATA[17]	EADRS[1]	EBS[1]	ECS	EWE	EDATA[7]	EDATA[4]	EDATA[1]	AVSSAD8	GIN	VRT8	DVSSAD10	CVBSIN	VBGR10	STREAM	WM2DTQ[4]	WM2DTO[6]	WM1DTO[1]	WM1DTO[6]	WM1DTI[4]	PEDCTL	REC656O[1]	REC656O[3]	27
26	AT1DATA[8]	AT1DATA[13]	AT1DATA[15]	EDATA[26]	EDATA[29]	EDATA[30]	EADRS[2]	EADRS[10]	EADRS[11]	ECAS	EDATA[8]	EDATA[5]	EDATA[2]	DVSSAD8	CRIN	CIN	VRBD10	VRT10	NBC10	SYNC	WM2DTO[3]	WM1DTO[0]	WM1DTO[5]	WM1DTI[2]	WM1DTI[7]	ACCCTL	REC656O[2]	AVDD2DA10	26
25	AT1DATA[7]	AT1DATA[6]	AT1DATA[14]	EDATA[27]	EDATA28]	EDATA[31]	EADRS[4]	EADRS[6]	EADRS[8]	ECLKEN	EDATA[9]	EDATA[11]	EDATA[13]	DVDDAD8	AVDDAD8	AVSSAD8	VRB10	AVSSAD10	TSRW	WM2DTO[0]	WM2DTO[7]	WM1DTO[2]	WM1DTI[0]	WM1DTI[6]	AGCCTL	REC656O[5]	YOUT	AVSS2DA10	25
24	AT1DATA[2]	AT1DATA[1]	AT1DATA[5]	AT1DATA[10]	AT1DATA[14]	EDATA[3]	EADRS[5]	EADRS[7]	EADRS[9]	ECLKO	EDATA[10]	EDATA[12]	EDATA[14]	EDATA[15]	AVSSAD8	DVDDAD10	VRTD10	TSCLK	WM2DTO[1]	WM2DTO[4]	WM1DTO[3]	WM2DTC[1]	WM1DTI[5]	REC656O[0]	COUT	IREF[1]	ROUT	AVDD1DA10	24
23	AT1DIOW	AT1DMACK	AT1DATA[0]	AT1DATA[3]	AT1DATA[9]	GND	VDD3	VDD	GND	VDD3	VDD	GND	VDD3	VDD	GND	VDD2	VDD	GND	VDD2	VDD	GND	VDD3	VDD	REC656O[4]	AVDD1DA10	BOUT	DVACK	DVREQ	23
22	AT1ADR[1]	AT1INTRQ	AT1DIOR	AT1RESET	AT1DATA4]	VDD3																	VDD3	IREF[0]	AVSS1DA10	REC656O[6]	DVVIDEO[0]	DVVIDEO[1]	22
21	AT1CS[0]	AT1CS[1]	AT1ADR[0]	AT1IORDY	AT1DMARQ	VDD																	VDD	GOUT	REC656O[7]	DVVIDEO[3]	DVVIDEO[4]	PLL2AVSS	21
20	AT2DATA[11]	AT2DATA[12]	AT1DATA[13]	AT2DATA[14]	AT1ADR[2]	GND																	GND	DVVIDEO[2]	ADMCLKI	PLL2AVDD	DVVCLKI	DVVIDEO[7]	20
19	AT2DATA[6]	AT2DATA[7]	AT2DATA[8]	AT2DATA[10]	AT2DATA[15]	VDD3																	VDD3	R656CLKI	DVVIDEO[5]	REC656I[0]	REC656I[1]	REC656I[2]	19
18	AT2DATA[1]	AT2DATA[2]	AT2DATA[4]	AT2DATA[5]	AT2DATA[9]	VDD																	VDD	DVVIDEO[6]	REC656I[3]	REC656I[4]	REC656I[6]	REC656I[7]	18
17	AT2DIOW	AT2DMARQ	AT2RESET	AT2DATA[0]	AT2DATA[3]	GND						GND	GND	GND	GND	GND	GND						GND	REC656I[5]	PXCLK	DVVCLKO	PLLRST	TRST	17
16	AT2ADR[2]	AT2INTRQ	AT2IORDY	AT2DIOR	AT2DMACK	VDD3						GND	GND	GND	GND	GND	GND						VDD3	TCK	TDI	TDO	TMS	PLLON	16
15	AT2MODE	AT2CS[0]	AT2CS[1]	AT2ADR[0]	AT2ADR[1]	VDD						GND	GND	GND	GND	GND	GND						VDD	VIPWM	CSYNC	TESTMOD[0]	TESTMOD[1]	TESTMOD[2]	15
14	RESET	VDD	DBI	TRACE	VDD	GND						GND	GND	GND	GND	GND	GND						VDD	TESTMOD[6]	VDD	TESTMOD[5]	TESTMOD[4]	TESTMOD[3]	14
13	PCO	PLL3AVSS	PLL3AVDD	VMCLK	PLL1AVDD	VDD3						GND	GND	GND	GND	GND	GND						VDD3	HADRS[28]	HADRS[29]	HADRS[24]	HADRS[25]	HADRS[26]	13
12	PLL1AVSS	ADCCLKO	VDD	DVAMCLKO	DVAMCLKI	VDD						GND	GND	GND	GND	GND	GND						GND	HADRS[27]	HADRS[19]	HADRS[18]	HADRS[23]	HADRS[22]	12
11	DACCLKO	AMCLK1	AMCLK2	ARDATA[1]	ARDATA[0]	GND																	VDD	HADRS[15]	HADRS[16]	HADRS[17]	HADRS[20]	HADRS[21]	11
10	ARDATA[14]	ARDATA[15]	ARDATA[4]	ARDATA[3]	ARDATA[2]	VDD2																	VDD3	HDCS[1]	HDCS[0]	HCAS	HRAS	HCLKEN	10
9	ARDATA[11]	ARDATA[12]	ARDATA[13]	ARDATA[6]	ARDATA[5]	VDD																	GND	HDATA[7]	HDWE	DQMWS[0]	DQMWS[1]	HCLKO	9
8	ARDATA[10]	ARDATA[9]	ARWE	ARDQM[0]	ARDATA[7]	GND																	VDD	HDATA[6]	HDATA[5]	HDATA[4]	HDATA[8]	HDATA[9]	8
7	ARDATA[8]	ARDQM[1]	ARCS[0]	ARRAS	ARCAS	VDD3																	VDD3	HADRS[9]	HDATA[2]	HDATA[3]	HDATA11]	HDATA[10]	7
6	ARCLKO	ARADRS[12]	ARADRS[13]	ARADRS[14]	ARCS[1]	VDD	VDD3	GND	VDD	VDD3	VDD	GND	VDD3	VDD	GND	VDD3	VDD	GND	VDD3	VDD	GND	VDD3	VDD	HADRS[10]	HDATA[1]	HDATA[0]	HDATA[12]	HDATA[13]	6
5	ARADRS[11]	ARADRS[9]	ARADRS[1]	ARADRS[0]	ARADRS[10]	SPDIFI	ACMOD[0]	BCKO	DVDADT[4]	DVDAADR[0]	SCIDATA[0]	SPIDATAO	DDATA[11]	DDATA[8]	DCLKO	DADRS[9]	DADRS[8]	INT[7]	INT[1]	CTS[2]	RTS[0]	TX[3]	HWAIT	HCS[5]	HADRS[11]	HADRS[12]	HDATA[15]	HDATA[14]	5
4	ARADRS[8]	ARADRS[3]	ARADRS[2]	SRCBCKI	SRCDATAO	ACMOD[1]	LRCKO	DVDADT[3]	DVDAREQ	SCIDATA[1]	SPICS	DDATA[14]	DDATA[12]	DDATA[9]	DDQM[1]	DADRS[11]	DADRS[7]	DADRS[6]	INT[6]	INT[2]	CTS[1]	RX[3]	TX[2]	HDACK[0]	VDD	HCS[0]	HADRS[13]	HADRS[14]	4
3	ARADRS[7]	ARADRS[6]	SRCLRCKI	SRCLRCKO	DVBCK	ADATAI	DVDADT[5]	DVDADT[1]	DVDAACK	VDD	SPIDATAI	DDATA[15]	DDATA[13]	DDATA[10]	DWE	DCS	DADRS[10]	DADRS[5]	DADRS[4]	INT[3]	SCLK[0]	CTS[0]	RX[2]	TX[1]	HDREQ[0]	HCS[3]	HCS[2]	HADRS[30]	3
2	ARADRS[5]	ARADRS[4]	SRCBCKO	SPDIFO	BCKI	DVDADT[7]	DVDADT[6]	DVDADT[0]	SCICS[1]	SCICLK[1]	SPICLK	DDATA[2]	DDATA[3]	DDATA[6]	DDQM[0]	DRAS	DBS[1]	DADRS[1]	DADRS[2]	INT[4]	SCLK[1]	RTS[3]	RTS[2]	RX[1]	HDACK[1]	HOE	HCS[4]	HCS[1]	2
1	VDD	SRCDATAI	DVLRCK	DVADATA	LRCKI	ADATAO	DVDADT[2]	DVDAADR[1]	SCICS[0]	SCICLK[0]	DDATA[0]	DDATA[1]	DDATA[4]	DDATA[5]	DDATA[7]	DCAS	DBS[0]	DADRS[0]	DADRS[3]	INT[5]	INT[0]	CTS[3]	RTS[1]	RX[0]	TX[0]	HDREQ[1]	NC	NC	1
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	Y	AA	AB	AC	AD	AE	AF	AG	AH	

VDD : 1.2V Power supply
VDD3 : 3.3V Power supply
GND : Ground

● **Pin Function**

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
1	VDD3	VDD3	–	3.3V I/O power supply	56	V26	VRT10	–	TOP side reference voltage
2	GND	GND	–	Ground	57	V28	VRM10	–	Common voltage
3	VDD	VDD	–	1.2V LOGIC power supply	58	U25	VRB10	–	Bottom side reference voltage
4	AH28	VDD	–	1.2V LOGIC power supply	59	U26	VRBD10	I/O	Analog test bus (for debugging)
5	AF26	ACCCTL	O		60	U27	DVSSAD10	–	ADC part digital ground
6	AF27	PEDCTL	O	VIDEO-Analog, Output buffer	61	T24	DVDDAD10	–	ADC part digital power supply (3.3V)
7	AG28	HKEYPLS	O	VIDEO-Analog, Output buffer	62	GND	GND	–	Ground
8	GND	GND	–	Ground	63	VDD	VDD	–	1.2V LOGIC power supply
9	AE26	WM1DTI[7]	I/O	WM/VWM, Bidirectional buffer	64	U28	AVDDAD8	–	
10	AD25	WM1DTI[6]	I/O	WM/VWM, Bidirectional buffer	65	T25	AVSSAD8	–	
11	AC24	WM1DTI[5]	I/O	WM/VWM, Bidirectional buffer	66	T26	CIN	I	VIDEO-Analog
12	AE27	WM1DTI[4]	I/O	WM/VWM, Bidirectional buffer	67	T27	VRT8	–	VIDEO-Analog
13	AF28	WM1DTI[3]	I/O	WM/VWM, Bidirectional buffer	68	T28	VRB8	–	VIDEO-Analog
14	AD26	WM1DTI[2]	I/O	WM/VWM, Bidirectional buffer	69	R25	AVDDAD8	–	
15	AE28	WM1DTI[1]	I/O	WM/VWM, Bidirectional buffer	70	R24	AVSSAD8	–	
16	AC25	WM1DTI[0]	I/O	WM/VWM, Bidirectional buffer	71	R26	CRIN	I	VIDEO-Analog
17	AB24	WM1DTO[7]	I/O	WM/VWM, Bidirectional buffer	72	R28	BG8	–	VIDEO-Analog
18	VDD	VDD	–	1.2V LOGIC power supply	73	P28	AVDDAD8	–	
19	GND	GND	–	Ground	74	P27	AVSSAD8	–	
20	AD27	WM1DTO[6]	I/O	WM/VWM, Bidirectional buffer	75	R27	GIN	I	VIDEO-Analog
21	AC26	WM1DTO[5]	I/O	WM/VWM, Bidirectional buffer	76	P26	DVSSAD8	–	
22	AD28	WM1DTO[4]	I/O	WM/VWM, Bidirectional buffer	77	P25	DVDDAD8	–	
23	AA24	WM1DTO[3]	I/O	WM/VWM, Bidirectional buffer	78	GND	GND	–	Ground
24	AB25	WM1DTO[2]	I/O	WM/VWM, Bidirectional buffer	79	P24	EDATA[15]	I/O	SDRAM ENC, Bidirectional buffer
25	VDD	VDD	–	1.2V LOGIC power supply	80	VDD3	VDD3	–	3.3V I/O power supply
26	AC27	WM1DTO[1]	I/O	WM/VWM, Bidirectional buffer	81	N28	EDATA[0]	I/O	SDRAM ENC, Bidirectional buffer
27	GND	GND	–	Ground	82	N27	EDATA[1]	I/O	SDRAM ENC, Bidirectional buffer
28	AC28	WMCLKO	O	WM/VWM, Output buffer	83	N26	EDATA[2]	I/O	SDRAM ENC, Bidirectional buffer
29	VDD3	VDD3	–	3.3V I/O power supply	84	VDD	VDD	–	1.2V LOGIC power supply
30	AB26	WM1DTO[0]	I/O	WM/VWM, Bidirectional buffer	85	N25	EDATA[13]	I/O	SDRAM ENC, Bidirectional buffer
31	AA25	WM2DTO[7]	O	WM/VWM, Output buffer	86	GND	GND	–	Ground
32	AB27	WM2DTO[6]	O	WM/VWM, Output buffer	87	M28	EDATA[3]	I/O	SDRAM ENC, Bidirectional buffer
33	AB28	VDD	–	1.2V LOGIC power supply	88	GND	GND	–	Ground
34	Y24	WM2DTO[5]	O	WM/VWM, Output buffer	89	N24	EDATA[14]	I/O	SDRAM ENC, Bidirectional buffer
35	AA27	WM2DTO[4]	O	WM/VWM, Output buffer	90	M27	EDATA[4]	I/O	SDRAM ENC, Bidirectional buffer
36	AA26	WM2DTO[3]	O	WM/VWM, Output buffer	91	M26	EDATA[5]	I/O	SDRAM ENC, Bidirectional buffer
37	AA28	WM2DTO[2]	O	WM/VWM, Output buffer	92	VDD3	VDD3	–	3.3V I/O power supply
38	W24	WM2DTO[1]	O	WM/VWM, Output buffer	93	M25	EDATA[11]	I/O	SDRAM ENC, Bidirectional buffer
39	GND	GND	–	Ground	94	L28	EDATA[6]	I/O	SDRAM ENC, Bidirectional buffer
40	Y25	WM2DTO[0]	O	WM/VWM, Output buffer	95	L27	EDATA[7]	I/O	SDRAM ENC, Bidirectional buffer
41	GND	GND	–	Ground	96	VDD	VDD	–	1.2V LOGIC power supply
42	Y26	SYNC	I/O	TS OUT, Bidirectional buffer	97	M24	EDATA[12]	I/O	SDRAM ENC, Bidirectional buffer
43	Y27	STREAM	I/O	TS OUT,Bidirectional buffer	98	GND	GND	–	Ground
44	Y28	PACKETEN	I/O	TS OUT,Bidirectional buffer	99	L26	EDATA[8]	I/O	SDRAM ENC, Bidirectional buffer
45	VDD3	VDD3	–	3.3V IO power supply	100	GND	GND	–	Ground
46	W25	TSRW	O	TS OUT,Output buffer	101	L25	EDATA[9]	I/O	SDRAM ENC, Bidirectional buffer
47	GND	GND	–	Ground	102	K28	EDQM	O	SDRAM ENC, Output buffer
48	V24	TSCLK	O	TS OUT,Output buffer	103	K27	EWE	O	SDRAM ENC, Output buffer
49	VDD3	VDD3	–	3.3V I/O power supply	104	VDD3	VDD3	–	3.3V I/O power supply
50	W26	NBC10	–	Bias current adjustment terminal	105	K26	ECAS	O	SDRAM ENC, Output buffer
51	W27	VBGR10	I/O	Analog test bus (for debugging)	106	L24	EDATA[10]	I/O	SDRAM ENC, Bidirectional buffer
52	W28	AVDDAD10	–	ADC part analog power supply (3.3V)	107	K25	ECLKEN	O	Output buffer, 4/6mA
53	V25	AVSSAD10	–	ADC part analog Ground	108	VDD	VDD	–	1.2V LOGIC power supply
54	V27	CVBSIN	I	Analog Input	109	J28	ERAS	O	SDRAM ENC, Output buffer
55	U24	VRTD10	–	Input common bias	110	GND	GND	–	Ground

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
111	J27	ECS	O	SDRAM ENC, Output buffer	166	VDD3	VDD3	–	3.3V I/O power supply
112	GND	GND	–	Ground	167	C25	AT1DATA[11]	I/O	ATAPI-DVD, Bidirectional buffer
113	J26	EADRS[11]	O	SDRAM ENC, Output buffer	168	D24	AT1DATA[10]	I/O	ATAPI-DVD, Bidirectional buffer
114	J25	EADRS[8]	O	SDRAM ENC, Output buffer	169	E23	AT1DATA[9]	I/O	ATAPI-DVD, Bidirectional buffer
115	GND	GND	–	Ground	170	GND	GND	–	Ground
116	K24	ECLKO	O	SDRAM ENC, Output buffer	171	A26	AT1DATA[8]	I/O	ATAPI-DVD, Bidirectional buffer
117	VDD3	VDD3	–	3.3V I/O power supply	172	A25	AT1DATA[7]	I/O	ATAPI-DVD, Bidirectional buffer
118	H28	EBS[0]	O	SDRAM ENC, Output buffer	173	B25	AT1DATA[6]	I/O	ATAPI-DVD, Bidirectional buffer
119	H27	EBS[1]	O	SDRAM ENC, Output buffer	174	GND	GND	–	Ground
120	H26	EADRS[10]	O	SDRAM ENC, Output buffer	175	C24	AT1DATA[5]	I/O	ATAPI-DVD, Bidirectional buffer
121	VDD	VDD	–	1.2V LOGIC power supply	176	VDD3	VDD3	–	3.3V I/O power supply
122	G28	EADRS[0]	O	SDRAM ENC, Output buffer	177	E22	AT1DATA[4]	I/O	ATAPI-DVD, Bidirectional buffer
123	GND	GND	–	Ground	178	VDD	VDD	–	1.2V LOGIC power supply
124	J24	EADRS[9]	O	SDRAM ENC, Output buffer	179	D23	AT1DATA[3]	I/O	ATAPI-DVD, Bidirectional buffer
125	GND	GND	–	Ground	180	A24	AT1DATA[2]	I/O	ATAPI-DVD, Bidirectional buffer
126	G27	EADRS[1]	O	SDRAM ENC, Output buffer	181	B24	AT1DATA[1]	I/O	ATAPI-DVD, Bidirectional buffer
127	H25	EADRS[6]	O	SDRAM ENC, Output buffer	182	GND	GND	–	Ground
128	G26	EADRS[2]	O	SDRAM ENC, Output buffer	183	C23	AT1DATA[0]	I/O	ATAPI-DVD, Bidirectional buffer
129	VDD3	VDD3	–	3.3V I/O power supply	184	D22	AT1RESET	O	Output buffer,8mA
130	F27	EDATA[17]	I/O	SDRAM ENC, Bidirectional buffer	185	E21	AT1DMARQ	I	ATAPI-DVD, Input buffer
131	F28	EDATA[16]	I/O	SDRAM ENC, Bidirectional buffer	186	GND	GND	–	Ground
132	H24	EADRS[7]	O	SDRAM ENC, Output buffer	187	B23	AT1DMACK	O	ATAPI-DVD, Output buffer
133	VDD	VDD	–	1.2V LOGIC power supply	188	VDD3	VDD3	–	3.3V I/O power supply
134	G25	EADRS[4]	O	SDRAM ENC, Output buffer	189	A23	AT1DIOW	O	ATAPI-DVD, Output buffer
135	GND	GND	–	Ground	190	VDD	VDD	–	1.2V LOGIC power supply
136	F26	EDATA[30]	I/O	SDRAM ENC, Bidirectional buffer	191	C22	AT1DIOR	O	ATAPI-DVD, Output buffer
137	GND	GND	–	Ground	192	D21	AT1IORDY	I	ATAPI-DVD, Input buffer
138	E27	EDATA[19]	I/O	SDRAM ENC, Bidirectional buffer	193	B22	AT1INTRQ	I	ATAPI-DVD, Input buffer
139	E28	EDATA[18]	I/O	SDRAM ENC, Bidirectional buffer	194	GND	GND	–	Ground
140	F25	EDATA[31]	I/O	SDRAM ENC, Bidirectional buffer	195	E20	AT1ADR[2]	O	ATAPI-DVD, Output buffer
141	VDD3	VDD3	–	3.3V I/O power supply	196	A22	AT1ADR[1]	O	ATAPI-DVD, Output buffer
142	E26	EDATA[29]	I/O	SDRAM ENC, Bidirectional buffer	197	C21	AT1ADR[0]	O	ATAPI-DVD, Output buffer
143	G24	EADRS[5]	O	SDRAM ENC, Output buffer	198	GND	GND	–	Ground
144	D28	EDATA[20]	I/O	SDRAM ENC, Bidirectional buffer	199	B21	AT1CS[1]	O	ATAPI-DVD, Output buffer
145	VDD	VDD	–	1.2V LOGIC power supply	200	VDD3	VDD3	–	3.3V I/O power supply
146	D27	EDATA[21]	I/O	SDRAM ENC, Bidirectional buffer	201	A21	AT1CS[0]	O	ATAPI-DVD, Output buffer
147	GND	GND	–	Ground	202	VDD	VDD	–	1.2V LOGIC power supply
148	C28	EDATA[22]	I/O	SDRAM ENC, Bidirectional buffer	203	E19	AT2DATA[15]	I/O	ATAPI-HDD, Bidirectional buffer
149	GND	GND	–	Ground	204	D20	AT2DATA[14]	I/O	ATAPI-HDD, Bidirectional buffer
150	F24	EADRS[3]	O	SDRAM ENC, Output buffer	205	C20	AT2DATA[13]	I/O	ATAPI-HDD, Bidirectional buffer
151	E25	EDATA[28]	I/O	SDRAM ENC, Bidirectional buffer	206	GND	GND	–	Ground
152	D26	EDATA[26]	I/O	SDRAM ENC, Bidirectional buffer	207	B20	AT2DATA[12]	I/O	ATAPI-HDD, Bidirectional buffer
153	VDD3	VDD3	–	3.3V I/O power supply	208	A20	AT2DATA[11]	I/O	ATAPI-HDD, Bidirectional buffer
154	B28	EDATA[23]	I/O	SDRAM ENC, Bidirectional buffer	209	D19	AT2DATA[10]	I/O	ATAPI-HDD, Bidirectional buffer
155	C27	EDATA[25]	I/O	SDRAM ENC, Bidirectional buffer	210	GND	GND	–	Ground
156	B27	EDATA24]	I/O	SDRAM ENC, Bidirectional buffer	211	E18	AT2DATA[9]	I/O	ATAPI-HDD, idirectional buffer
157	VDD	VDD	–	1.2V LOGIC power supply	212	VDD3	VDD3	–	3.3V I/O power supply
158	D25	EDATA[27]	I/O	SDRAM ENC, Bidirectional buffer	213	C19	AT2DATA[8]	I/O	ATAPI-HDD, Bidirectional buffer
159	GND	GND	–	Ground	214	VDD	VDD	–	1.2V LOGIC power supply
160	C26	AT1DATA[15]	I/O	ATAPI-DVD, Bidirectional buffer	215	B19	AT2DATA[7]	I/O	ATAPI-HDD, Bidirectional buffer
161	E24	AT1DATA[14]	I/O	ATAPI-DVD, Bidirectional buffer	216	A19	AT2DATA[6]	I/O	ATAPI-HDD, Bidirectional buffer
162	GND	GND	–	Ground	217	D18	AT2DATA[5]	I/O	ATAPI-HDD, Bidirectional buffer
163	A28	VDD	–	1.2V LOGIC power supply	218	GND	GND	–	Ground
164	B26	AT1DATA[13]	I/O	ATAPI-DVD, Bidirectional buffer	219	C18	AT2DATA[4]	I/O	ATAPI-HDD, Bidirectional buffer
165	A27	AT1DATA[12]	I/O	ATAPI-DVD, Bidirectional buffer	220	E17	AT2DATA[3]	I/O	ATAPI-HDD, Bidirectional buffer

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
221	B18	AT2DATA[2]	I/O	ATAPI-HDD, Bidirectional buffer	276	VDD3	VDD3	–	3.3V I/O power supply
222	GND	GND	–	Ground	277	C11	AMCLK2	I	CLOCK, Input buffer
223	A18	AT2DATA[1]	I/O	ATAPI-HDD, Bidirectional buffer	278	GND	GND	–	Ground
224	VDD3	VDD3	–	3.3V I/O power supply	279	D11	ARDATA[1]	I/O	SDRAM-ATAPI, Bidirectional buffer
225	D17	AT2DATA[0]	I/O	ATAPI-HDD, Bidirectional buffer	280	VDD3	VDD3	–	3.3V I/O power supply
226	VDD	VDD	–	1.2V LOGIC power supply	281	A10	ARDATA[14]	I/O	SDRAM-ATAPI, Bidirectional buffer
227	C17	AT2RESET	I/O	ATAPI-HDD, Bidirectional buffer	282	VDD	VDD	–	1.2V LOGIC power supply
228	B17	AT2DMARQ	I	ATAPI-HDD, Input buffer	283	B10	ARDATA[15]	I/O	SDRAM-ATAPI, Bidirectional buffer
229	E16	AT2DMACK	O	ATAPI-HDD, Output buffer	284	E11	ARDATA[0]	I/O	SDRAM-ATAPI, Bidirectional buffer
230	GND	GND	–	Ground	285	C10	ARDATA[4]	I/O	SDRAM-ATAPI, Bidirectional buffer
231	A17	AT2DIOW	O	ATAPI-HDD, Output buffer	286	GND	GND	–	Ground
232	D16	AT2DIOR	O	ATAPI-HDD, Output buffer	287	D10	ARDATA[3]	I/O	SDRAM-ATAPI, Bidirectional buffer
233	C16	AT2IORDY	I	ATAPI-HDD, Input buffer	288	A9	ARDATA[11]	I/O	SDRAM-ATAPI, Bidirectional buffer
234	GND	GND	–	Ground	289	B9	ARDATA[12]	I/O	SDRAM-ATAPI, Bidirectional buffer
235	B16	AT2INTRQ	I	ATAPI-HDD, Input buffer	290	GND	GND	–	Ground
236	VDD3	VDD3	–	3.3V I/O power supply	291	C9	ARDATA[13]	I/O	SDRAM-ATAPI, Bidirectional buffer
237	A16	AT2ADR[2]	I/O	ATAPI-HDD, Bidirectional buffer	292	E10	ARDATA[2]	I/O	SDRAM-ATAPI, Bidirectional buffer
238	VDD	VDD	–	1.2V LOGIC power supply	293	D9	ARDATA[6]	I/O	SDRAM-ATAPI, Bidirectional buffer
239	E15	AT2ADR[1]	I/O	ATAPI-HDD, Bidirectional buffer	294	VDD3	VDD3	–	3.3V I/O power supply
240	GND	GND	–	Ground	295	A8	ARDATA[10]	I/O	SDRAM-ATAPI, Bidirectional buffer
241	D15	AT2ADR[0]	I/O	ATAPI-HDD, Bidirectional buffer	296	B8	ARDATA[9]	I/O	SDRAM-ATAPI, Bidirectional buffer
242	VDD	VDD	–	1.2V LOGIC power supply	297	C8	ARWE	O	SDRAM-ATAPI, Output buffer
243	C15	AT2CS[1]	O	ATAPI-HDD, Output buffer	298	VDD	VDD	–	1.2V LOGIC power supply
244	GND	GND	–	Ground	299	A7	ARDATA[8]	I/O	SDRAM-ATAPI, Bidirectional buffer
245	B15	AT2CS[0]	O	ATAPI-HDD, Output buffer	300	E9	ARDATA[5]	I/O	SDRAM-ATAPI, Bidirectional buffer
246	VDD	VDD	–	1.2V LOGIC power supply	301	D8	ARDQM[0]	O	SDRAM-ATAPI, Output buffer
247	A15	AT2MODE	I	ATAPI-HDD, Input buffer	302	GND	GND	–	Ground
248	GND	GND	–	Ground	303	B7	ARDQM[1]	O	SDRAM-ATAPI, Output buffer
249	GND	GND	–	Ground	304	C7	ARCS[0]	O	SDRAM-ATAPI, Output buffer
250	A14	RESET	I	Input buffer (5V tolerant)	305	VDD3	VDD3	–	3.3V I/O power supply
251	VDD3	VDD3	–	3.3V I/O power supply	306	A6	ARCLKO	O	SDRAM-ATAPI, Output buffer
252	B14	VDD	–	1.2V LOGIC power supply	307	GND	GND	–	Ground
253	C14	DBI	I	TEST, Input buffer	308	B6	ARADRS[12]	O	SDRAM-ATAPI, Output buffer
254	GND	GND	–	Ground	309	E8	ARDATA[7]	I/O	SDRAM-ATAPI, Bidirectional buffer
255	D14	TRACE	I	TEST, Input buffer	310	D7	ARRAS	O	SDRAM-ATAPI, Output buffer
256	E14	VDD	–	1.2V LOGIC power supply	311	VDD3	VDD3	–	3.3V I/O power supply
257	A13	PCO	O	CLOCK, 3 state output buffer	312	A5	ARADRS[11]	O	SDRAM-ATAPI, Output buffer
258	GND	GND	–	Ground	313	C6	ARADRS[13]	O	SDRAM-ATAPI, Output buffer
259	B13	PLL3AVSS	–		314	B5	ARADRS[9]	O	SDRAM-ATAPI, Output buffer
260	C13	PLL3AVDD	–		315	VDD	VDD	–	1.2V LOGIC power supply
261	D13	VMCLK	I	CLOCK, Input buffer	316	E7	ARCAS	O	SDRAM-ATAPI, Output buffer
262	E13	PLL1AVDD	–		317	D6	ARADRS[14]	O	SDRAM-ATAPI, Output buffer
263	A12	PLL1AVSS	–		318	C5	ARADRS[1]	O	SDRAM-ATAPI, Output buffer
264	VDD3	VDD3	–	3.3V I/O power supply	319	GND	GND	–	Ground
265	B12	ADCCLKO	O	CLOCK, Output buffer	320	B4	ARADRS[3]	O	SDRAM-ATAPI, Output buffer
266	GND	GND	–	Ground	321	A4	ARADRS[8]	O	SDRAM-ATAPI, Output buffer
267	C12	VDD	–	1.2V LOGIC power supply	322	A3	ARADRS[7]	O	SDRAM-ATAPI, Output buffer
268	VDD3	VDD3	–	3.3V I/O power supply	323	GND	GND	–	Ground
269	D12	DVAMCLKO	O	CLOCK, Output buffer	324	E6	ARCS[1]	O	SDRAM-ATAPI, Output buffer
270	GND	GND	–	Ground	325	D5	ARADRS[0]	O	SDRAM-ATAPI, Output buffer
271	A11	DACCLKO	O	CLOCK, Output buffer	326	C4	ARADRS[2]	O	SDRAM-ATAPI, Output buffer
272	VDD3	VDD3	–	3.3V I/O power supply	327	VDD3	VDD3	–	3.3V I/O power supply
273	E12	DVAMCLKI	I	AUDIO CLOCK, Input buffer	328	A2	ARADRS[5]	O	SDRAM-ATAPI, Output buffer
274	GND	GND	–	Ground	329	B3	ARADRS[6]	O	SDRAM-ATAPI, Output buffer
275	B11	AMCLK1	I	CLOCK, Input buffer	330	B2	ARADRS[4]	O	SDRAM-ATAPI, Output buffer

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
331	GND	GND	–	Ground	386	VDD	VDD	–	1.2V LOGIC power supply
332	E5	ARADRS[10]	O	SDRAM-ATAPI, Output buffer	387	GND	GND	–	Ground
333	D4	SRCBCKI	I	AUDIO, Input buffer	388	L3	SPIDATAI	I/O	HOST, Bidirectional buffer
334	VDD3	VDD3	–	3.3V I/O power supply	389	VDD	VDD	–	1.2V LOGIC power supply
335	C3	SRCLRCKI	I	AUDIO, Input buffer	390	M5	SPIDATAO	I/O	HOST, Bidirectional buffer
336	B1	SRCDATAI	I	AUDIO, Input buffer	391	GND	GND	–	Ground
337	A1	VDD	–	1.2V LOGIC power supply	392	L2	SPICLK	I/O	HOST, Bidirectional buffer
338	GND	GND	–	Ground	393	GND	GND	–	Ground
339	C2	SRCBCKO	O	AUDIO, Output buffer	394	L1	DDATA[0]	I/O	SDRAM-DEC, Bidirectional buffer
340	VDD	VDD	–	1.2V LOGIC power supply	395	VDD3	VDD3	–	3.3V I/O power supply
341	D3	SRCLRCKO	O	AUDIO, Output buffer	396	M4	DDATA[14]	I/O	SDRAM-DEC, Bidirectional buffer
342	E4	SRCDATAO	O	AUDIO, Output buffer	397	M3	DDATA[15]	I/O	SDRAM-DEC, Bidirectional buffer
343	F5	SPDIFI	I	AUDIO, Input buffer	398	M2	DDATA[2]	I/O	SDRAM-DEC, Bidirectional buffer
344	D2	SPDIFO	O	AUDIO, Output buffer	399	VDD	VDD	–	1.2V LOGIC power supply
345	C1	DVLRCK	I/O	AUDIO, Bidirectional buffer	400	N5	DDATA[11]	I/O	SDRAM-DEC, Bidirectional buffer
346	E3	DVBCK	I/O	AUDIO, Bidirectional buffer	401	GND	GND	–	Ground
347	D1	DVADATA	I/O	AUDIO, Bidirectional buffer	402	M1	DDATA[1]	I/O	SDRAM-DEC, Bidirectional buffer
348	F4	ACMOD[1]	I	AUDIO, Input buffer	403	GND	GND	–	Ground
349	G5	ACMOD[0]	I	AUDIO, Input buffer	404	N4	DDATA[12]	I/O	SDRAM-DEC, Bidirectional buffer
350	E1	LRCKI	I	AUDIO, Input buffer	405	N3	DDATA[13]	I/O	SDRAM-DEC, Bidirectional buffer
351	E2	BCKI	I	AUDIO, Input buffer	406	N2	DDATA[3]	I/O	SDRAM-DEC, Bidirectional buffer
352	GND	GND	–	Ground	407	VDD3	VDD3	–	3.3V I/O power supply
353	F3	ADATAI	I	AUDIO, Input buffer	408	N1	DDATA[4]	I/O	SDRAM-DEC, Bidirectional buffer
354	GND	GND	–	Ground	409	P5	DDATA[8]	I/O	SDRAM-DEC, Bidirectional buffer
355	G4	LRCKO	O	AUDIO, Output buffer	410	P4	DDATA[9]	I/O	SDRAM-DEC, Bidirectional buffer
356	VDD	VDD	–	1.2V LOGIC power supply	411	VDD	VDD	–	1.2V LOGIC power supply
357	H5	BCKO	O	AUDIO, Output buffer	412	P3	DDATA[10]	I/O	SDRAM-DEC, Bidirectional buffer
358	F1	ADATAO	O	DVD-AUDIO, Output buffer	413	GND	GND	–	Ground
359	F2	DVDADT[7]	O	DVD-AUDIO, Output buffer	414	P2	DDATA[6]	I/O	SDRAM-DEC, Bidirectional buffer
360	G2	DVDADT[6]	O	DVD-AUDIO, Output buffer	415	GND	GND	–	Ground
361	G3	DVDADT[5]	O	DVD-AUDIO, Output buffer	416	P1	DDATA[5]	I/O	SDRAM-DEC, Bidirectional buffer
362	J5	DVDADT[4]	O	DVD-AUDIO, Output buffer	417	R1	DDATA[7]	I/O	SDRAM-DEC, Bidirectional buffer
363	H4	DVDADT[3]	O	DVD-AUDIO, Output buffer	418	R2	DDQM[0]	O	SDRAM-DEC, Output buffer
364	G1	DVDADT[2]	O	DVD-AUDIO, Output buffer	419	VDD3	VDD3	–	3.3V I/O power supply
365	H3	DVDADT[1]	O	DVD-AUDIO, Output buffer	420	R3	DWE	O	SDRAM-DEC, Output buffer
366	H2	DVDADT[0]	O	DVD-AUDIO, Output buffer	421	VDD	VDD	–	1.2V LOGIC power supply
367	H1	DVDAADR[1]	O	DVD-AUDIO, Output buffer	422	R4	DDQM[1]	O	SDRAM-DEC, Output buffer
368	K5	DVDAADR[0]	O	DVD-AUDIO, Output buffer	423	GND	GND	–	Ground
369	J4	DVDAREQ	I/O	DVD-AUDIO, Bidirectional buffer	424	R5	DCLKO	O	SDRAM-DEC, Output buffer
370	GND	GND	–	Ground	425	VDD3	VDD3	–	3.3V I/O power supply
371	J3	DVDAACK	O	DVD-AUDIO, Output buffer	426	VDD	VDD	–	1.2V LOGIC power supply
372	VDD	VDD	–	1.2V LOGIC power supply	427	T1	DCAS	O	SDRAM-DEC, Output buffer
373	J2	SCICS[1]	I/O	HOST, Bidirectional buffer	428	GND	GND	–	Ground
374	VDD3	VDD3	–	3.3V I/O power supply	429	T2	DRAS	–	SDRAM-DEC, Output buffer
375	J1	SCICS[0]	I/O	HOST, Bidirectional buffer	430	GND	GND	–	Ground
376	VDD	VDD	–	1.2V LOGIC power supply	431	T3	DCS	O	SDRAM-DEC, Output buffer
377	K4	SCIDATA[1]	I/O	HOST, Bidirectional buffer	432	T4	DADRS[11]	O	SDRAM-DEC, Output buffer
378	GND	GND	–	Ground	433	U1	DBS[0]	O	SDRAM-DEC, Output buffer
379	L5	SCIDATA[0]	I/O	HOST, Bidirectional buffer	434	VDD3	VDD3	–	3.3V I/O power supply
380	K3	VDD	–	1.2V LOGIC power supply	435	T5	DADRS[9]	O	SDRAM-DEC, Output buffer
381	K2	SCICLK[1]	I/O	HOST, Bidirectional buffer	436	U2	DBS[1]	O	SDRAM-DEC, Output buffer
382	GND	GND	–	Ground	437	U3	DADRS[10]	O	SDRAM-DEC, Output buffer
383	K1	SCICLK[0]	I/O	HOST, Bidirectional buffer	438	VDD	VDD	–	1.2V LOGIC power supply
384	GND	GND	–	Ground	439	U4	DADRS[7]	O	SDRAM-DEC, Output buffer
385	L4	SPICS	I/O	HOST, Bidirectional buffer	440	GND	GND	–	Ground

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
441	V1	DADRS[0]	O	SDRAM-DEC, Output buffer	496	VDD	VDD	–	1.2V LOGIC power supply
442	GND	GND	–	Ground	497	AD4	HDACK[0]	O	Output buffer, 4mA
443	V2	DADRS[1]	O	SDRAM-DEC, Output buffer	498	AF1	HDREQ[1]	I	HOST, Input buffer
444	VDD	VDD	–	1.2V LOGIC power supply	499	AE3	HDREQ[0]	I	HOST, Input buffer
445	U5	DADRS[8]	O	SDRAM-DEC, Output buffer	500	AC5	HWAIT	I	HOST, Input buffer
446	GND	GND	–	Ground	501	AF2	HOE	O	HOST, Output buffer
447	V3	DADRS[5]	O	SDRAM-DEC, Output buffer	502	VDD3	VDD3	–	3.3V I/O power supply
448	VDD3	VDD3	–	3.3V I/O power supply	503	GND	GND	–	Ground
449	V4	DADRS[6]	O	SDRAM-DEC, Output buffer	504	AE4	VDD	–	1.2V LOGIC power supply
450	W1	DADRS[3]	O	SDRAM-DEC, Output buffer	505	AD5	HCS[5]	O	HOST, Output buffer
451	W2	DADRS[2]	O	SDRAM-DEC, Output buffer	506	AG2	HCS[4]	O	HOST, Output buffer
452	VDD	VDD	–	1.2V LOGIC power supply	507	AF3	HCS[3]	O	HOST, Output buffer
453	W3	DADRS[4]	O	SDRAM-DEC, Output buffer	508	AG3	HCS[2]	O	HOST, Output buffer
454	GND	GND	–	Ground	509	AH2	HCS[1]	O	HOST, Output buffer
455	GND	GND	–	Ground	510	GND	GND	–	Ground
456	GND	GND	–	Ground	511	AF4	HCS[0]	O	HOST, Output buffer
457	V5	INT[7]	I/O	HOST, Bidirectional buffer	512	VDD	VDD	–	1.2V LOGIC power supply
458	VDD	VDD	–	1.2V LOGIC power supply	513	AD6	HADRS[10]	I/O	HOST, Bidirectional buffer
459	W4	INT[6]	I/O	HOST, Bidirectional buffer	514	GND	GND	–	Ground
460	Y1	INT[5]	I/O	HOST, Bidirectional buffer	515	AE5	HADRS[11]	I/O	HOST, Bidirectional buffer
461	Y2	INT[4]	I/O	HOST, Bidirectional buffer	516	AG4	HADRS[13]	I/O	HOST, Bidirectional buffer
462	VDD3	VDD3	–	3.3V I/O power supply	517	AH3	HADRS[30]	I/O	HOST, Bidirectional buffer
463	Y3	INT[3]	I/O	HOST, Bidirectional buffer	518	VDD3	VDD3	–	3.3V I/O power supply
464	GND	GND	–	Ground	519	AF5	HADRS[12]	I/O	HOST, Bidirectional buffer
465	Y4	INT[2]	I/O	HOST, Bidirectional buffer	520	GND	GND	–	Ground
466	VDD	VDD	–	1.2V LOGIC power supply	521	AH4	HADRS[14]	I/O	HOST, Bidirectional buffer
467	W5	INT[1]	I/O	HOST, Bidirectional buffer	522	AE6	HDATA[1]	I/O	HOST, Bidirectional buffer
468	AA1	INT[0]	I/O	HOST, Bidirectional buffer	523	AD7	HADRS[9]	I/O	HOST, Bidirectional buffer
469	AA2	SCLK[1]	I/O	HOST, Bidirectional buffer	524	VDD3	VDD3	–	3.3V I/O power supply
470	AA3	SCLK[0]	I/O	HOST, Bidirectional buffer	525	AG5	HDATA[15]	I/O	HOST, Bidirectional buffer
471	AB1	CTS[3]	I/O	HOST, Bidirectional buffer	526	GND	GND	–	Ground
472	GND	GND	–	Ground	527	AH5	HDATA[14]	I/O	HOST, Bidirectional buffer
473	Y5	CTS[2]	I/O	HOST, Bidirectional buffer	528	GND	GND	–	Ground
474	GND	GND	–	Ground	529	AF6	HDATA[0]	I/O	HOST, Bidirectional buffer
475	AA4	CTS[1]	I/O	HOST, Bidirectional buffer	530	AD8	HDATA[6]	I/O	HOST, Bidirectional buffer
476	VDD	VDD	–	1.2V LOGIC power supply	531	AE7	HDATA[2]	I/O	HOST, Bidirectional buffer
477	AB3	CTS[0]	I/O	HOST, Bidirectional buffer	532	VDD3	VDD3	–	3.3V I/O power supply
478	AB2	RTS[3]	I/O	HOST, Bidirectional buffer	533	AG6	HDATA[12]	I/O	HOST, Bidirectional buffer
479	AC2	RTS[2]	I/O	HOST, Bidirectional buffer	534	VDD	VDD	–	1.2V LOGIC power supply
480	AC1	RTS[1]	I/O	HOST, Bidirectional buffer	535	AH6	HDATA[13]	I/O	HOST, Bidirectional buffer
481	AA5	RTS[0]	I/O	HOST, Bidirectional buffer	536	AG7	HDATA[11]	I/O	HOST, Bidirectional buffer
482	VDD3	VDD3	–	3.3V I/O power supply	537	AF7	HDATA[3]	I/O	HOST, Bidirectional buffer
483	AB4	RX[3]	I/O	HOST, Bidirectional buffer	538	GND	GND	–	Ground
484	GND	GND	–	Ground	539	AE8	HDATA[5]	I/O	HOST, Bidirectional buffer
485	AC3	RX[2]	I/O	HOST, Bidirectional buffer	540	GND	GND	–	Ground
486	VDD	VDD	–	1.2V LOGIC power supply	541	AD9	HDATA[7]	I/O	HOST, Bidirectional buffer
487	AD2	RX[1]	I/O	HOST, Bidirectional buffer	542	AF8	HDATA[4]	I/O	HOST, Bidirectional buffer
488	AD1	RX[0]	I/O	HOST, Bidirectional buffer	543	AH7	HDATA[10]	I/O	HOST, Bidirectional buffer
489	AB5	TX[3]	I/O	HOST, Bidirectional buffer	544	VDD3	VDD3	–	3.3V I/O power supply
490	AC4	TX[2]	I/O	HOST, Bidirectional buffer	545	AG8	HDATA[8]	I/O	HOST, Bidirectional buffer
491	AD3	TX[1]	I/O	HOST, Bidirectional buffer	546	VDD	VDD	–	1.2V LOGIC power supply
492	GND	GND	–	Ground	547	AH8	HDATA[9]	I/O	HOST, Bidirectional buffer
493	AE1	TX[0]	I/O	HOST, Bidirectional buffer	548	AE9	HDWE	O	HOST, Output buffer
494	GND	GND	–	Ground	549	AF9	DQMWS[0]	O	HOST, Output buffer
495	AE2	HDACK[1]	O	HOST, Output buffer	550	GND	GND	–	Ground

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
551	AD10	HDCS[1]	O	HOST, Output buffer	606	AG16	TMS	I	TEST, nput buffer
552	GND	GND	–	Ground	607	GND	GND	–	Ground
553	AG9	DQMWS[1]	O	HOST, Output buffer	608	AF16	TDO	O	TEST, Output buffer
554	VDD3	VDD3	–	3.3V I/O power supply	609	VDD	VDD	–	1.2V LOGIC power supply
555	AH9	HCLKO	O	HOST, Output buffer	610	AE16	TDI	I	TEST, Input buffer
556	GND	GND	–	Ground	611	VDD3	VDD3	–	3.3V I/O power supply
557	AE10	HDCS[0]	O	HOST, Output buffer	612	AH17	TRST	I	TEST, Input buffer
558	VDD3	VDD3	–	3.3V I/O power supply	613	GND	GND	–	Ground
559	AD11	HADRS[15]	I/O	HOST, Bidirectional buffer	614	AD16	TCK	I	TEST, Input buffer
560	VDD	VDD	–	1.2V LOGIC power supply	615	VDD3	VDD3	–	3.3V I/O power supply
561	AF10	HCAS	O	HOST, Output buffer	616	AG17	PLLRST	I	CLOCK, Input buffer
562	AG10	HRAS	O	HOST, Output buffer	617	GND	GND	–	Ground
563	AH10	HCLKEN	O	HOST, Output buffer	618	AF17	DVVCLKO	O	CLOCK, Output buffer
564	GND	GND	–	Groud	619	VDD3	VDD3	–	3.3V I/O power supply
565	AE11	HADRS[16]	I/O	HOST, Bidirectional buffer	620	AE17	PXCLK	O	CLOCK, Output buffer
566	GND	GND	–	Ground	621	GND	GND	–	Ground
567	AF11	HADRS[17]	I/O	HOST, Bidirectional buffer	622	AH18	REC656I[7]	I	VIDEO-Digital, Input buffer
568	AD12	HADRS[27]	I/O	HOST, Bidirectional buffer	623	VDD	VDD	–	1.2V LOGIC power supply
569	AG11	HADRS[20]	I/O	HOST, Bidirectional buffer	624	AG18	REC656I[6]	I	VIDEO-Digital, Input buffer
570	VDD3	VDD3	–	3.3V I/O power supply	625	GND	GND	–	Ground
571	AH11	HADRS[21]	I/O	HOST, Bidirectional buffer	626	AD17	REC656I[5]	I	VIDEO-Digital, Input buffer
572	VDD	VDD	–	1.2V LOGIC power supply	627	AF18	REC656I[4]	I	VIDEO-Digital, Input buffer
573	AE12	HADRS[19]	I/O	HOST, Bidirectional buffer	628	AE18	REC656I[3]	I	VIDEO-Digital, Input buffer
574	AF12	HADRS[18]	I/O	HOST, Bidirectional buffer	629	AH19	REC656I[2]	I	VIDEO-Digital, Input buffer
575	AG12	HADRS[23]	I/O	HOST, Bidirectional buffer	630	AG19	REC656I[1]	I	VIDEO-Digital, Input buffer
576	GND	GND	–	Ground	631	AF19	REC656I[0]	I	VIDEO-Digital, Input buffer
577	AD13	HADRS[28]	I/O	HOST, Bidirectional buffer	632	AH20	DVVIDEO[7]	I/O	VIDEO-Digital, Bidirectional buffer
578	VDD	VDD	–	1.2V LOGIC power supply	633	AD18	DVVIDEO[6]	I/O	VIDEO-Digital, Bidirectional buffer
579	AH12	HADRS[22]	I/O	HOST, Bidirectional buffer	634	AE19	DVVIDEO[5]	I/O	VIDEO-Digital, Bidirectional buffer
580	GND	GND	–	Ground	635	VDD3	VDD3	–	3.3V I/O power supply
581	AE13	HADRS[29]	I/O	HOST, Bidirectional buffer	636	AG20	DVVCLKI	I	CLOCK, Input buffer
582	VDD	VDD	–	1.2V LOGIC power supply	637	AF20	PLL2AVDD	–	
583	AF13	HADRS[24]	I/O	HOST, Bidirectional buffer	638	AH21	PLL2AVSS	–	
584	VDD3	VDD3	–	3.3V I/O power supply	639	AD19	R656CLKI	I	CLOCK, Input buffer
585	AG13	HADRS[25]	I/O	HOST, Bidirectional buffer	640	GND	GND	–	Ground
586	GND	GND	–	Ground	641	AE20	ADMCLKI	I	CLOCKI, Input buffer
587	AH13	HADRS[26]	I/O	HOST, Bidirectional buffer	642	VDD3	VDD3	–	3.3V I/O power supply
588	GND	GND	–	Ground	643	AG21	DVVIDEO[4]	I/O	VIDEO-Digital, Bidirectional buffer
589	GND	GND	–	Ground	644	AF21	DVVIDEO[3]	I/O	VIDEO-Digital, Bidirectional buffer
590	AD14	TESTMOD[6]	I	TEST, Input buffer	645	AD20	DVVIDEO[2]	I/O	VIDEO-Digital, Bidirectional buffer
591	AE14	VDD	–	1.2V LOGIC power supply	646	AH22	DVVIDEO[1]	I/O	VIDEO-Digital, Bidirectional buffer
592	AF14	TESTMOD[5]	I	TEST, Input buffer	647	AG22	DVVIDEO[0]	I/O	VIDEO-Digital, Bidirectional buffer
593	GND	GND	–	Ground	648	AE21	REC656O[7]	O	VIDEO-Digital, Output buffer
594	AG14	TESTMOD[4]	I	TEST, Input buffer	649	AF22	REC656O[6]	O	VIDEO-Digital, Output buffer
595	VDD	VDD	–	1.2V LOGIC power supply	650	VDD	VDD	–	1.2V LOGIC power supply
596	AH14	TESTMOD[3]	I	TEST, Input buffer	651	AH23	DVREQ	I	VIDEO-Digital, Input buffer
597	GND	GND	–	Ground	652	GND	GND	–	Ground
598	AH15	TESTMOD[2]	I	TEST, Input buffer	653	AG23	DVACK	O	VIDEO-Digital, Output buffer
599	VDD	VDD	–	1.2V LOGIC power supply	654	GND	GND	–	Ground
600	AG15	TESTMOD[1]	I	TEST, Input buffer	655	AE22	AVSS1DA10	–	
601	GND	GND	–	Ground	656	AD21	GOUT	O	VIDEO-Analog
602	AF15	TESTMOD[0]	I	TEST, Input buffer	657	AH24	AVDD1DA10	–	
603	AE15	CSYNC	I	CLOCK, Input buffer	658	AF23	BOUT	O	VIDEO-Analog
604	AD15	VIPWM	O	CLOCK, Output buffer	659	AE23	AVDD1DA10	–	
605	AH16	PLLON	I	TEST, Input buffer	660	AG24	ROUT	O	VIDEO-Analog

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
661	AD22	IREF[0]	–	VIDEO-Analog	669	AD23	REC656O[4]	O	VIDEO-Digital, Output buffer
662	AF24	IREF[1]	–	VIDEO-Analog	670	AH27	REC656O[3]	O	VIDEO-Digital, Output buffer
663	AG25	YOUT	O	VIDEO-Analog	671	AG26	REC656O[2]	O	VIDEO-Digital, Output buffer
664	AH25	AVSS2DA10	–		672	AG27	REC656O[1]	O	VIDEO-Digital, Output buffer
665	AE24	COUT	O	VIDEO-Analog	673	GND	GND	–	Ground
666	AH26	AVDD2DA10	–		674	AD24	REC656O[0]	O	VIDEO-Digital, Output buffer
667	GND	GND	–	Ground	675	AE25	AGCCTL	O	VIDEO-Analog
668	AF25	REC656O[5]	O	VIDEO-Digital, Output buffer					

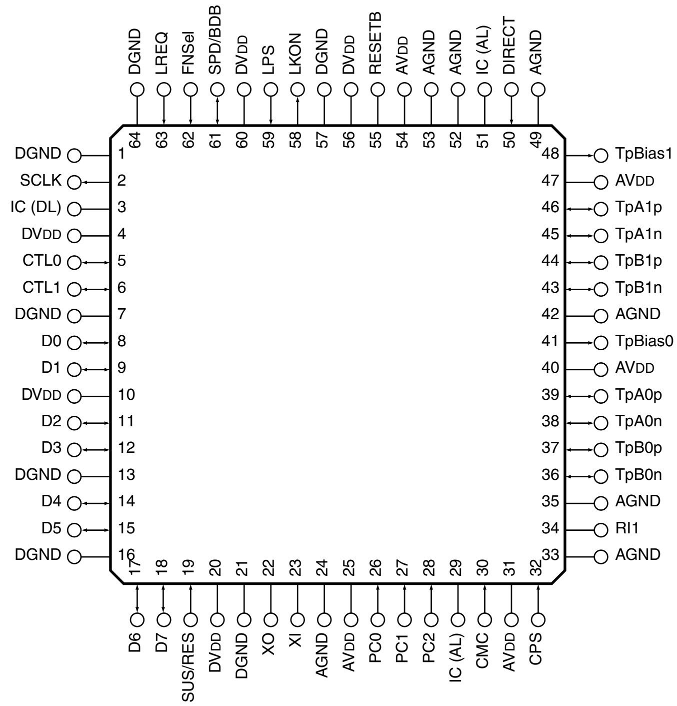
● Others

BALL Address	Pin Name	BALL Address	Pin Name	BALL Address	Pin Name	BALL Address	Pin Name
AA23	GND	P12	GND	AC11	VDD	AB23	VDD3
AA6	GND	P13	GND	AC14	VDD	AB6	VDD3
AC12	GND	P14	GND	AC6	VDD	AC10	VDD3
AC17	GND	P15	GND	AC8	VDD	AC13	VDD3
AC20	GND	P16	GND	L6	VDD	AC16	VDD3
AC9	GND	P17	GND	AC11	VDD	AC19	VDD3
F11	GND	R12	GND	AC14	VDD	AC22	VDD3
F14	GND	R13	GND	AC6	VDD	AC7	VDD3
F17	GND	R14	GND	AC8	VDD	F10	VDD3
F20	GND	R15	GND	L6	VDD	F13	VDD3
F23	GND	R16	GND	P6	VDD	F16	VDD3
F8	GND	R17	GND	U6	VDD	F19	VDD3
H6	GND	R23	GND	Y6	VDD	F22	VDD3
J23	GND	R6	GND	F12	VDD	F7	VDD3
M12	GND	T12	GND	F6	VDD	G23	VDD3
M13	GND	T13	GND	F9	VDD	G6	VDD3
M14	GND	T14	GND	J6	VDD	K23	VDD3
M15	GND	T15	GND	AC15	VDD	K6	VDD3
M16	GND	T16	GND	AC18	VDD	N23	VDD3
M17	GND	T17	GND	AC21	VDD	N6	VDD3
M23	GND	U12	GND	AC23	VDD	T23	VDD3
M6	GND	U13	GND	F15	VDD	T6	VDD3
N12	GND	U14	GND	F18	VDD	W23	VDD3
N13	GND	U15	GND	F21	VDD	W6	VDD3
N14	GND	U16	GND	H23	VDD		
N15	GND	U17	GND	L23	VDD		
N16	GND	V23	GND	P23	VDD		
N17	GND	V6	GND	U23	VDD		
				Y23	VDD		

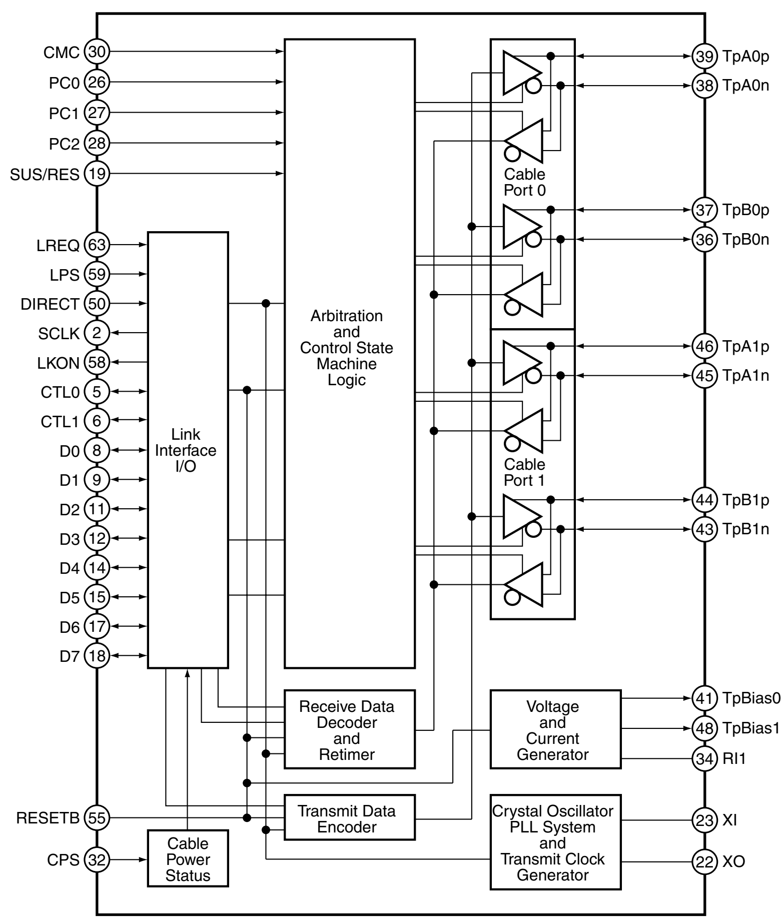
UPD72852AGB-8EU (MAIN ASSY : IC5101)

- IEEE1394 Physical IC

● Pin Arrangement



● Block Diagram



● Pin Function

• Cable Interface Pins

No.	Pin Name	I/O	Function
39	TpA0p	I/O	Port 0 twisted pair cable A positive phase I/O
38	TpA0n	I/O	Port 0 twisted pair cable A negative phase I/O
37	TpB0p	I/O	Port 0 twisted pair cable B positive phase I/O
36	TpB0n	I/O	Port 0 twisted pair cable B negative phase I/O
46	TpA1p	I/O	Port 1 twisted pair cable A positive phase I/O
45	TpA1n	I/O	Port 1 twisted pair cable A negative phase I/O
44	TpB1p	I/O	Port 1 twisted pair cable B positive phase I/O
43	TpB1n	I/O	Port 1 twisted pair cable B negative phase I/O
19	SUS/RES	I	Suspend/Resume function select 1 : Suspend/Resume on (IEEE1394a-2000 compliant) 0 : Suspend/Resume off (P1394a draft 1.3 compliant)
32	CPS	I	Cable power status Connect to the cable through a 390 kΩ resistor and to the GND through a 100 kΩ resistor. 0 : Cable power fail 1 : Cable power on

• Link Interface Pins

No.	Pin Name	I/O	Function
8	D0	I/O	Data input/output (bit 0)
9	D1	I/O	Data input/output (bit 1)
11	D2	I/O	Data input/output (bit 2)
12	D3	I/O	Data input/output (bit 3)
14	D4	I/O	Data input/output (bit 4)
15	D5	I/O	Data input/output (bit 5)
17	D6	I/O	Data input/output (bit 6)
18	D7	I/O	Data input/output (bit 7)
5	CTL0	I/O	Link interface control (bit 0)
6	CTL1	I/O	Link interface control (bit 1)
63	LREQ	I	Link request input
2	SCLK	O	Link control output clock LPS 1 : 49.152 MHz output LPS 0 : Clamp to 0 (The clock signal will be output within 25 µsec after change to "0")
59	LPS	I	Link power status input 0 : Link power off 1 : Link power on (PHY/Link direct connection)
58	LKON	O	Link-on signal output Link-on signal is 6.1444 MHz clock output.
50	DIRECT	I	PHY/Link isolation barrier control input 0 : Isolation barrier 1 : PHY/Link direct connection

• Control Pins

No.	Pin Name	I/O	Function
26	PC0	I	Power class set input This pin status will be loaded to Pwr_class bit which allocated to PHY register 4H. IEEE1394a-2000 chapter [4.3.4.1]
27	PC1	I	
28	PC2	I	
30	CMC	I	Configuration manager capable setting This pin status will be loaded to Contender bit which allocated to PHY register 4H. 0 : Non contender 1 : Contender
55	RESETB	I	Power on reset input Connect to GND through a 0.1 µF capacitor. 0 : Reset 1 : Normal
61	SPD/BDB	I FNSel = 0	Speed select (UPD72852GB) 0 : MAX. S200 1 : MAX. S400
		O FNSel = 1	BIAS Detected output (Logical Inverse) 0 : BIAS is coming from some port. 1 : BIAS is not coming from any port.

• IC

No.	Pin Name	I/O	Function
29, 51	IC (AL)	–	Internally Connected (Low Clamped) Connected to GND.
3	IC (DL)	–	Internally Connected (Low Clamped) Connected to GND.

• Power Supply Pins

No.	Pin Name	I/O	Function
25, 31, 40, 47, 54	AVDD	–	Analog power
24, 33, 35, 42, 49, 52, 53	AGND	–	Analog GND
4, 10, 20, 56, 60	DVDD	–	Digital VDD
1, 7, 13, 16, 21, 57, 64	DGND	–	Digital GND

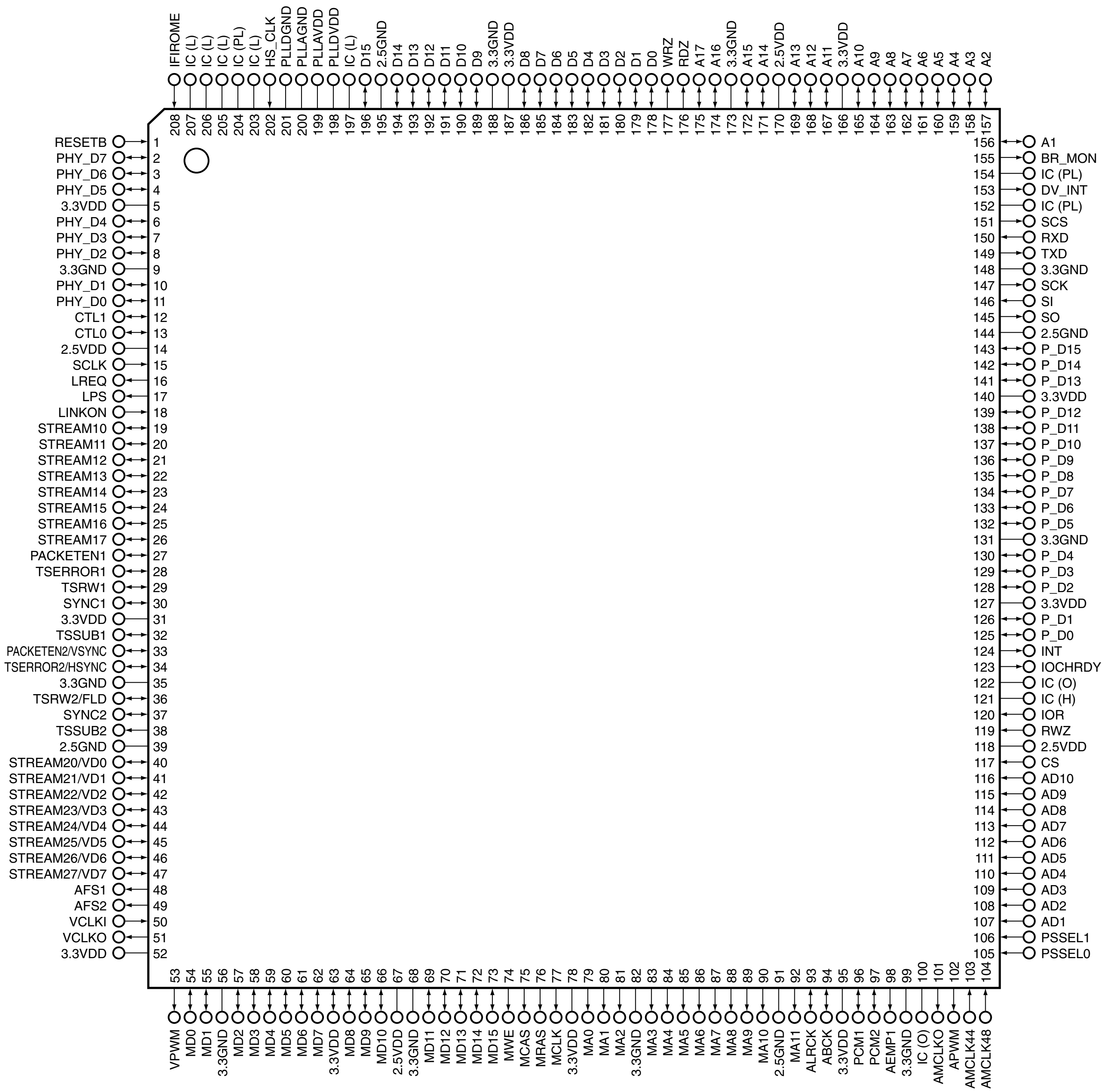
• Other Pins

No.	Pin Name	I/O	Function
41	TpBias0	O	Port 0 twisted pair output
48	TpBias1	O	Port 1 twisted pair output
34	RI1	–	Resistor connection pin 1 for reference current generator Please connect to GND pin through the 9.1 kΩ resistor.
23	XI	–	Crystal oscillator connection XI
22	XO	–	Crystal oscillator connection XO
62	FNSel	I	Function Select 0 : #61 acts as SPD (UPD72852GB compliant) 1 : #61 acts as BDB

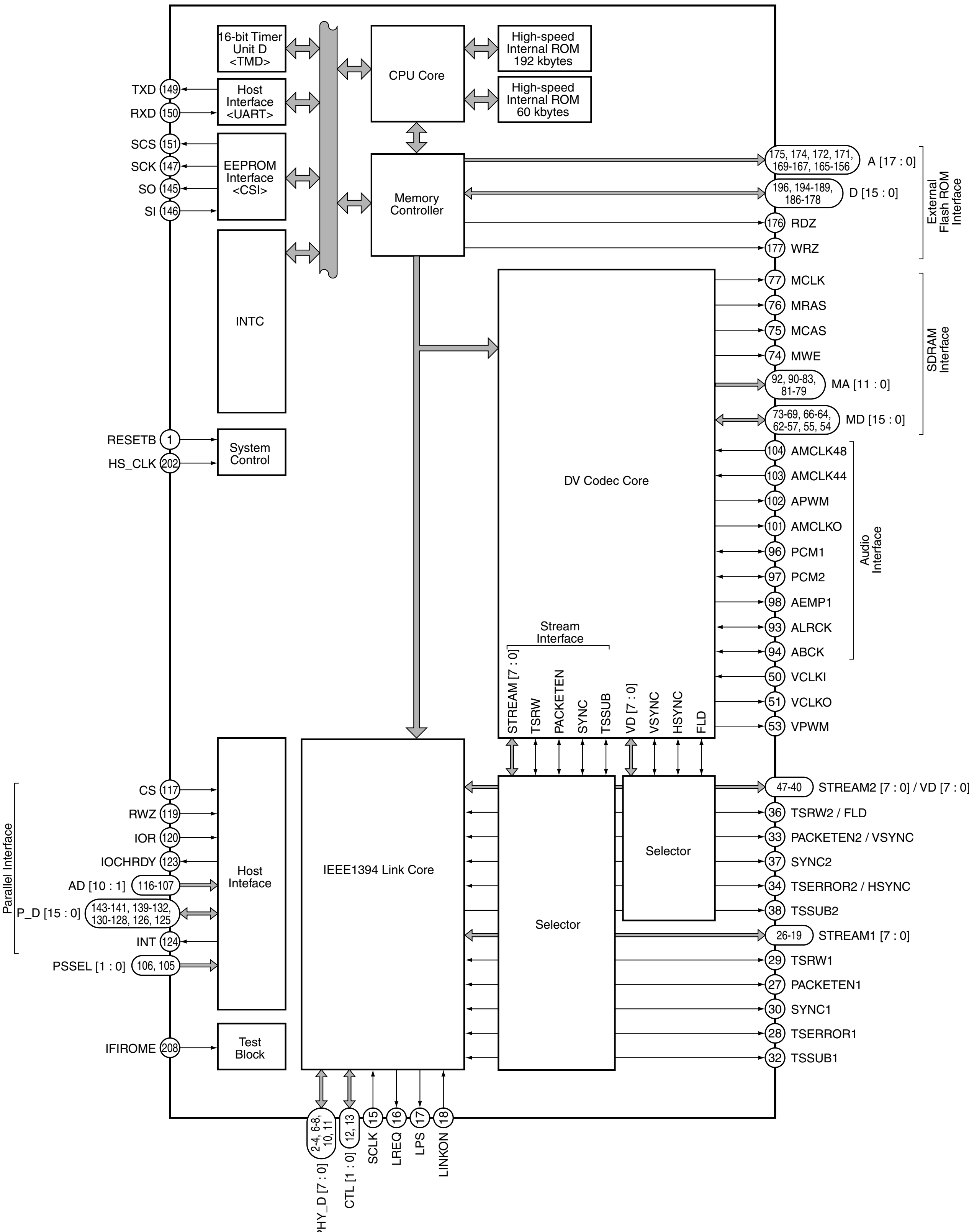
UPD72893BGD-LML (MAIN ASSY : IC5202)

- IEEE1394 Link IC

● Pin Arrangement



● **Block Diagram**



● **Pin Function**

(1) Link relation

No.	Pin Name	I/O	Function	Active
18	LINKON	I	Link-on signal input Clock input When LPS is active, input 0.	–
17	LPS	O	Link power status output Link power OFF : 0 Link power ON : 2.7 MHz pulse output (20 dividing of host clock 54 MHz)	–
16	LREQ	O	Link request output	–
15	SCLK	I	Clock input for Link control LPS is active : 49.152 MHz input LPS = 0 0 : fixed	–
12, 13	CTL [1 : 0]	I/O	PHY/Link control signal input/output	–
2-4, 6-8, 10,11	PHY_D [7 : 0]	I/O	Data input/output between PHY-Link	–
26-19	STREAM1 [7 : 0]	I/O	ISO data bus of stream interface 1	–
27	PACKETEN1	I/O	Packet enable signal input/output of stream interface 1	H/L
28	TSERROR1	I/O	Packet error signal input/output of stream interface 1	H/L
29	TSRW1	I/O	Data read/write enable signal input/output of stream interface 1	–
30	SYNC1	I/O	Frame synchronous signal input/output of stream interface 1	H/L
32	TSSUB1	I/O	Not used Connect to VDD or GND through a resistor.	H/L
47-40	STREAM2 [7 : 0]	I/O	ISO data bus of stream interface 2	–
33	PACKETEN2	I/O	Packet enable signal input/output of stream interface 2	H/L
34	TSERROR2	I/O	Packet error signal input/output of stream interface 2	H/L
36	TSRW2	I/O	Data read/write enable signal input/output of stream interface 2	–
37	SYNC2	I/O	Frame synchronous signal input/output of stream interface 2	H/L
38	TSSUB2	O	Not used Set to open.	–

(2) Video interface pins

No.	Pin Name	I/O	Function	Active
50	VCLKI	I	Video clock input (27 MHz)	–
51	VCLKO	O	Video clock output (27 MHz)	–
47-40	VD [7 : 0]	I/O	Video data signal	–
33	VSYNC	I/O	Video vertical sync. signal	L
34	HSYNC	I/O	Video horizontal sync. signal	L
36	FLD	I/O	Field index signal	–
53	VPWM	O	PWM signal for video PLL	–

(3) Audio interface pins

No.	Pin Name	I/O	Function	Active
104	AMCLK48	I	Audio master clock input for sampling frequency 48 kHz	–
103	AMCLK44	I	Audio master clock input for sampling frequency 44 kHz	–
101	AMCLKO	O	Audio master clock output	–
96	PCM1	I/O	Audio PCM serial data At 2ch : System 1 (data of audio block 1) At 4ch : System 1 The above is default setting value. Input/output data of PCM 1 and PCM 2 is replaced by Channel swap setting of an AUDIO_FUNC register.	–
97	PCM2	I/O	Audio PCM serial data At 2ch : Mute At 4ch : System 2 (data of audio block 2) The above is default setting value. Input/output data of PCM 1 and PCM 2 is replaced by Channel swap setting of an AUDIO_FUNC register. Note: Cannot use it in DV decode.	–
98	AEMP1	O	PCM1 emphasis ON/OFF in PCM 1 output	H
93	ALRCK	I/O	Audio LR clock L ch : High R ch : Low	–
94	ABCK	I/O	Audio bit clock	–
49, 48	AFS [2 : 1]	O	Audio sampling frequency AFS2 AFS1 44.1 kHz 0 1 48 kHz 0 0 32 kHz 1 0	–
102	APWM	O	PWM signal for audio PLL	–

(4) SDRAM interface pins

No.	Pin Name	I/O	Function	Active
77	MCLK	O	CLK pin connection of SDRAM	–
76	MRAS	O	RAS pin connection of SDRAM	–
75	MCAS	O	CAS pin connection of SDRAM	–
74	MWE	O	WE pin connection of SDRAM	–
92, 90-83, 81-79	MA [11 : 0]	O	Address pin connection of SDRAM	–
73-69, 66-64, 62-57, 55, 54	MD [15 : 0]	I/O	Data pin connection of SDRAM Note: Process of pull-up or pull down is necessary. So connect it to SDRAM directly.	–

(5) Host interface pins

(a) Parallel interface pins

No.	Pin Name	I/O	Function	Active
117	CS	I	Chip select input of parallel interface	L
119	RWZ	I	Read and write control input of parallel interface ISA type bus, SH-1 bus: Write strobe 68000 bus : Read/write selection signal	L
120	IOR	I	IO read control input of parallel interface ISA type bus, SH-1 bus : Read strobe 68000 bus : Data strobe (DS)	L
123	IOCHRDY	O	Ready output of parallel interface	L
116-107	AD [10 : 1]	I	Address input of parallel interface	–
143-141, 139-132, 130-128, 126, 125	P_D [15 : 0]	I/O	Data input/output of parallel interface	–

(b) Serial interface pins

No.	Pin Name	I/O	Function	Active
149	TXD	I/O	Serial transmission data output of unsynchronous serial interface (UART)	–
150	RXD	I/O	Serial transmission data input of unsynchronous serial interface (UART)	–

(c) Others

No.	Pin Name	I/O	Function	Active
124	INT	O	Interrupt output to the outside	H
106, 105	PSSEL [1 : 0]	I	Parallel/serial interface selection Input signal to select the outside interface which of parallel interface or serial interface. PSSEL [1 : 0] Select 00 Serial interface (UART) 01 Parallel interface (ISA type bus) 10 Parallel interface (68000 bus) 11 Parallel interface (SH-1 bus)	–

(6) External ROM connection pins

(a) Flash ROM interface pins

No.	Pin Name	I/O	Function	Active
196, 194-189, 186-178	D [15 : 0]	I/O	External ROM data bus Data bus in the external ROM access. Process of pull-up or pull down is necessary.	–
175, 174, 172, 171, 169-167, 165-156	A [17 : 1]	O	External ROM address bus Address bus in the external ROM access. Can addressing the 256k byte space.	–
176	RDZ	O	ROM read Strobe signal which shows a read cycle for external ROM. It becomes the inactive in the idle state.	L
177	WRZ	O	ROM write Strobe signal which shows a write cycle for external ROM.	L

(b) EEPROM interface pins

No.	Pin Name	I/O	Function	Active
145	SO	I/O	Serial transmit data output of clock-synchronous system serial interface (CSI)	–
146	SI	I/O	Serial receive data input of clock-synchronous system serial interface (CSI)	–
147	SCK	I/O	Clock output of clock-synchronous system serial interface (CSI)	–
151	SCS	I/O	Chip select output of clock-synchronous system serial interface (CSI)	–

(7) Clock and reset pins

No.	Pin Name	I/O	Function	Active
1	RESETB	I	Reset RESETB input is asynchronous input. When a signal of fixed low-level width is input without relation to an operation clock, take precedence of all operation, and reset the system. Note: RESETB is low-active.	L
202	HS_CLK	I	Host clock Clock input pin which is supplied to CPU core and built-in peripheral I/O. Please input 27 MHz clock. Perform 2 multiply with internal PLL by 27 MHz clock, 54 MHz clock is supplied to CPU core and internal peripheral I/O.	–

(8) Power supply and ground pins

No.	Pin Name	I/O	Function	Active
5, 31, 52, 63, 78, 95, 127, 140, 166, 187	3.3VDD	–	3.3V power supply 3.3V positive power supply pins. Power supply for 3.3V interface I/O.	–
14, 67, 118, 170	2.5VDD	–	2.5V power supply 2.5V positive power supply pins. Power supply for internal each block.	–
39, 91, 144, 195	2.5GND	–	Ground pins Connect all GND pins to the common ground.	–
9, 35, 56, 68, 82, 99, 131, 148, 173, 188	3.3GND			–
199	PLLAVDD	–	Analog power supply for multiply circuit Analog positive power supply pin for PLL. Supply 2.5V.	–
200	PLLAGND	–	Analog ground for multiply circuit Analog ground for PLL	–
198	PLLDVDD	–	Digital power supply for multiply circuit Digital positive power supply pin for PLL. Supply 2.5V.	–
201	PLLDGND	–	Digital ground for multiply circuit Digital ground for PLL	–
121	IC (H)	–	Internally connected pin Connect to VDD directly.	–
197, 203, 205-207	IC (L)	–	Internally connected pin Connect to ground directly.	–
152, 154, 204	IC (PL)	–	Internally connected pin Connect to ground through a resistor.	–
100, 122	IC (O)	–	Internally connected pin Set to open.	–

(9) Others

No.	Pin Name	I/O	Function	Active
153	DV_INT	I/O	Interrupt pin to the outside for the DV status read out.	H
155	BR_MON	I/O	Shows the bus reset occurred. There is some delay after real bus reset occurred because of set by the built-in firmware.	H
208	IFIROME	I	ROM operation selection input Set to 1 normally.	–

7.3 OUTLINE OF THE PRODUCT

Main newly developed technologies

1. Pickup

The pickup supports quadruple-speed recording for the DVD-R/RW.
A liquid-crystal tilt servo system is adopted for the pickup.

2. Recording-signal-processing LSI

• UPD3330GC (DRIVE Assy: IC101)

The recording-signal-processing module of conventional models consists of two chips, but this has been integrated into a single newly developed recording-signal-processing LSI, enabling stable performance and cost reduction.

3. AV-signal-processing LSI

• M65673WG (MAIN Assy: IC1001)

The AV-signal-processing module of conventional models consists of eleven chips, but this has been integrated into a single newly developed AV-signal-processing LSI, enabling large-scale cost reduction while maintaining the conventional functions. In the new LSI, all the basic functions necessary for a DVD recorder have been integrated. Like conventional models, this model is designed to support multitasking. The main functions are as follows:

• 3-D Y/C separation
• Video decoding
• Frame TBC
• MPEG video encoding
• Dolby Digital Consumer Encoding
• ATA/ATAPI I/F (2 ch)
• Main CPU (32-bit RISC, 54 MHz)
• Graphics engine (OSD, scaling, mixing)
• MPEG video decoding
• Audio decoding (AC-3, MPEG)
• Video encoding
• Progressive conversion
• Audio I/F
• 3-D DNR for playback

4. DV-signal-processing LSI

The DV-signal-processing LSI consists of the following two chips:

• UPD72852AGB-8EU (MAIN Assy: IC5101)

A 400-Mbps two-port PHY LSI in compliance with the IEEE1394a-2000 standards

• UPD72893BGD-LML (MAIN Assy: IC5202)

An EEE1394 link controller LSI having DV (digital video) encoding/decoding functions. Encoding/decoding of digital video signals in compliance with the SD specifications (NTSC/PAL) of the DV standard is supported. The 32-bit RISC CPU is built in for controlling the IEEE1394 bus and sending/receiving AV/C commands.

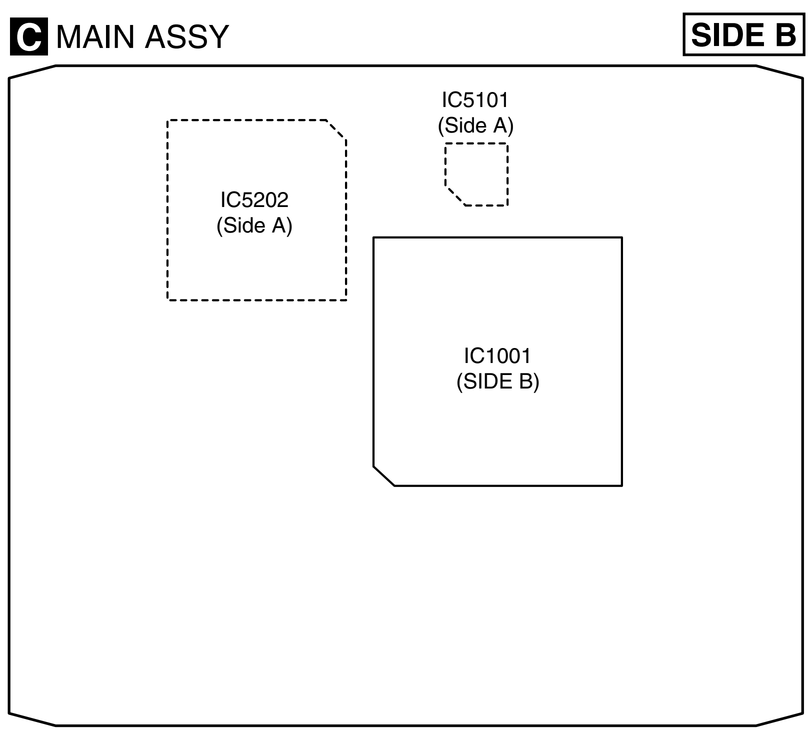


Fig.1 MAIN Assy

System configuration

In each signal-processing LSI of the main function blocks, various processes have been integrated into one chip, which enables simpler system configuration. With the AV-signal-processing LSI at the center, video inputs/outputs, audio inputs/outputs, DV inputs/outputs, writer and various memory cells are connected to it.

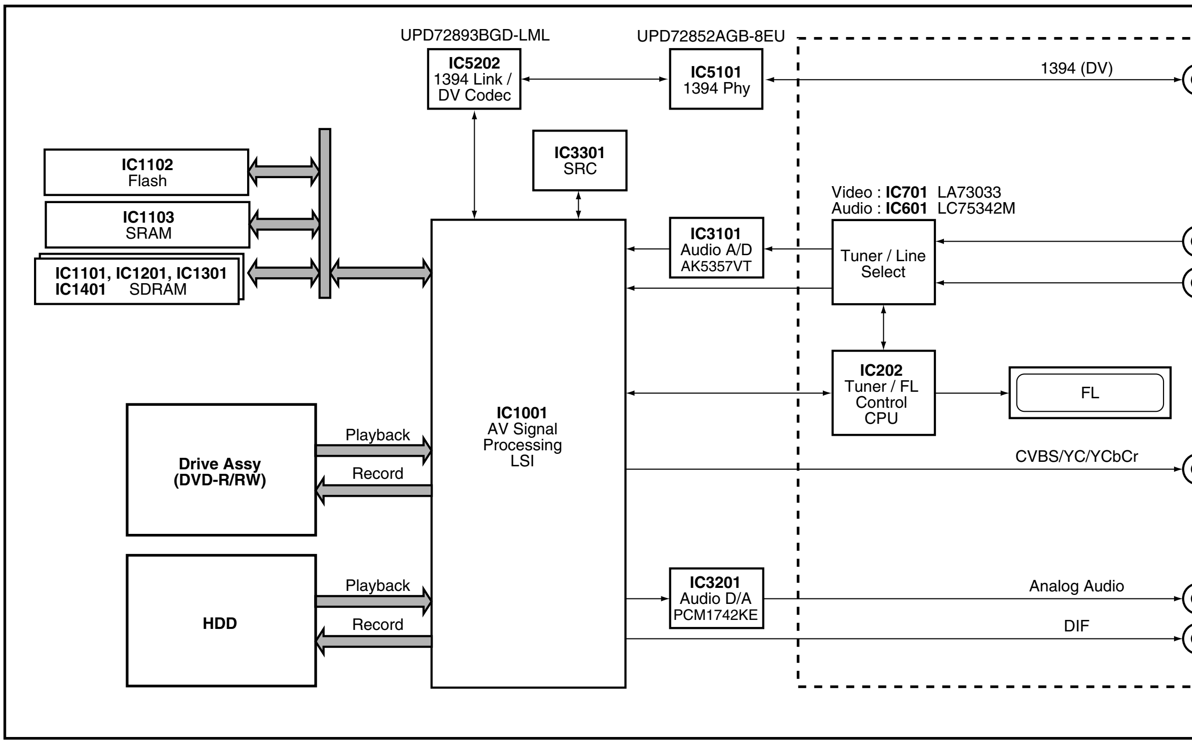


Fig2. System configuration

[Memorized Data]

- EEPROM (IC204 JCKB ASSY)
  The information about Tuner is backed up.
  (Pre-set CH, AFT ON/OFF, Skip CH, etc)
  Information about timed recording
  Other information
  (The state of Volume, remote control mode and last positions (Line/Tuner, etc)
- CPU SDRAM (IC1101 MAIN ASSY)
  The execution area and working area of a program
- FLASH ROM (IC1102 MAIN ASSY)
  The storing area of a program code and setting information
- SRAM (IC1103 MAIN ASSY)
  The working area for record and the storing area of setting information (backup RAM)
- DEC SDRAM (IC1201 MAIN ASSY)
  The working area of MPEG playback and OSD/Thumbnail
  (OSD is mainly for Disc Menu creation in Video mode)
- ENC SDRAM (IC1301 MAIN ASSY)
  The working area of MPEG recording and analog input and output (AVIO)
- ATA SDRAM (IC1401 MAIN ASSY)
  The working area of ATA/OSD2/Audio TBC (OSD2 is for all GUI.)
- ATA SDRAM (IC1421 MAIN ASSY)
  This is only for HDD model.
  The working area about HDD operation.
- DV SDRAM (IC5204 MAIN ASSY)
  The working area of Link and DV Codec

New functions and specifications

In this model, the following new functions and specifications have been included in addition to those of conventional models:

1. Improved multitasking functions

As both the HDD and DVD drive are mounted in this model, like conventional models, the unit is designed to support various multitasking. Furthermore, this model supports DVD multitasking (only in VR mode), which was impossible with conventional models.

ⓐ Pursuit playback
Playback of the title being recorded by the DVD drive in VR mode or the HDD is supported.

ⓑ Simultaneous recording/playback 1
Playback of a title other than that being recorded by the DVD drive in VR mode or the HDD is also supported.

ⓒ Simultaneous recording/playback 2
DVD playback during HDD recording is supported.

ⓓ Simultaneous recording/playback 3
HDD playback during DVD recording is supported.

ⓔ Recording during high-speed dubbing
HDD recording during high-speed dubbing from the HDD to a DVD is supported.

ⓕ Playback during high-speed dubbing
Playback of an HDD title during high-speed dubbing from the HDD to a DVD is supported.

2. Improved dubbing functions

High-speed dubbing and normal-speed dubbing are supported, as with conventional models. A one-touch dubbing function that enables automatic selection between these dubbing functions is also provided. In this model, high-speed dubbing from a DVD (in VR mode) to the HDD is also an added capability.

3. Disc backup

The function of creating a backup disc for a disc recorded in Video mode is added. The data of the original DVD are transferred to the HDD, then retransferred to the DVD drive, and because no reencoding is required during data transmission between the drives, a backup disc with no degradation of video and audio signals can be created.

4. Advanced disc NAVI

In the conventional disc NAVI function, recorded titles are displayed with still pictures as a list. In the advanced disc NAVI function, the title selected with the cursor is displayed as an animated picture with sound.

5. Improved Still Picture menu in Video mode

The disc NAVI function, which enables displaying a list of recorded titles with still pictures, is enabled in Video mode with this model. Selection from among nine title menus is also supported.

6. Adoption of MPEG2 SIF

In MN1-6 modes, MPEG2 SIF has been adopted, instead of the MPEG1 SIF of conventional models. This enables higher-quality recording for longer hours.

7. Improved editing functions

For DVD, the original/play-list editing in DVD-VR mode available with conventional models is provided.
For HDD editing, play-list-editing functions almost the same as for the DVD-VR, such as title combination, separation, and partial erasure, are enabled for the HDD with this model. With conventional models, these edit functions are available only for the dubbing list. The automatic-chapter-mark-insertion function in response to a change in audio type (stereo, monaural, bilingual) makes commercial-cutting editing easier.

8. Various-format playback

Playback of WMA, MP3, and JPEG formats is supported.

9. Other functions and specifications

The following main functions and specifications adopted with conventional models are also provided with this model:
- 192-kHz, 24-bit DAC
- 48-kHz, 20-bit ADC
- Digital 3-D Y/C separation circuit
- Digital frame TBC
- 3-D DNR
- DV (iLink) input/output
- Playback with commercials skipped
- CD/video-CD playback
- Picture creation
- Recording with 3/4-D1 and 2/3-D1 resolutions
- Recording mode with 32-step MNs
- LPCM recording
- High-resolution GUI
- Progressive output

7.4 CAUTIONS ON HANDLING THE HDD

(1) Cautions on Handling the HDD

- The HDD is very sensitive to shocks and vibrations. Care must be taken especially during operation (when the power is on).
- The HDD is very sensitive to electrostatic charges.
- Rapid change in temperature or humidity may cause deterioration of the HDD.

Note: After receiving damage caused by any above-mentioned factors, the HDD may operate normally for dozens or some hundreds of hours but then suddenly crash. If you are certain you have damaged a new repair part (HDD) while making repairs, do not use the part.

The HDD is about 10 times as sensitive to shock during operation than during nonoperation.

Reference: Main specifications on damage to the HDD

	During operation	During nonoperation
Shock G (acceleration)	<approx. 20 G	<approx. 200 G
Temperature change	< 20°C/hour	
Moisture change	< 20%/hour	

Reference: Estimate value of falling distance vs. shock (G) when the HDD is dropped without protection

Falling distance \ Landing surface	Granite surface	Concrete floor	Synthetic-resin-coated table	Antistatic sponge
0.5 inch / 12.7 mm	387	217	200	26
1.0 inch / 25.4 mm	595	457	310	37
2.0 inch / 50.8 mm	1133	600	680	70
4.0 inch / 101.6 mm	1795	1040	1050	267

(2) Cautions on handling the product on which the HDD is mounted or the HDD as a repair part, and examples of dangerous handling

[Cautions on handling the product on which the HDD is mounted]

- While the unit is turned on, the HDD is always in operation. Be sure NOT to impart shock to the unit.

● Examples of dangerous handling: while the power is on

- Bumping on the bonnet
- Dropping an object, such as a small screwdriver or remote control unit, onto the bonnet, or bumping an object against the cabinet
- Moving the unit by dragging
- Stacking another product on the unit

Note: Be sure NOT to impart shock, such as bumping or hitting a screwdriver against the HDD, during diagnosis with the bonnet open.

● Examples of dangerous handling: while the power is off

- Imparting strong shock, although the HDD is more resistant to shock when the power is off
- Dropping the unit from a height of several centimeters, or after lifting one side of the unit up, then letting the unit drop.

- Do NOT move the unit immediately after the power is turned off. Wait at least 30 seconds after the indication on the FL display changed from POWER OFF to the clock indication before moving the unit.
  If the AC power cord is accidentally disconnected before turning the unit off, wait at least for one minute before moving it. In this case, damage to the HDD caused by sudden shutoff may be small, because the emergency relief mechanism is activated. However, if sudden shutoff occurrs during recording or playback, recorded data may be damaged. Be sure to check operations.

[Cautions on handling the HDD as a repair part]

1. Handle the HDD in a safe environment:
   - Handle the HDD over an antistatic pad that can also absorb shock.
   - Wear wrist bands to prevent electrostatic charges generated in your body from affecting the HDD.

2. The following must be observed when handling the HDD:
   - Handle one HDD at a time. Do NOT hold several HDDs at the same time.
   - Grip the HDD on both sides so that you do not touch its terminals or circuit boards.
   - Do NOT stack one HDD onto another HDD (even if the HDDs are protected in antistatic bags).
   - Do NOT bump the HDDs against one another.
   - Do NOT bump any tool, such as a screwdriver, or other hard object against the HDD.
   - When a repair part (HDD) is transported and there is a large temperature difference between outdoors and indoors, to the indoor, leave it in its package for about a half day to gradually cool or warm the HDD to room temperature before unpacking it.

[Notes on packing for shipment]

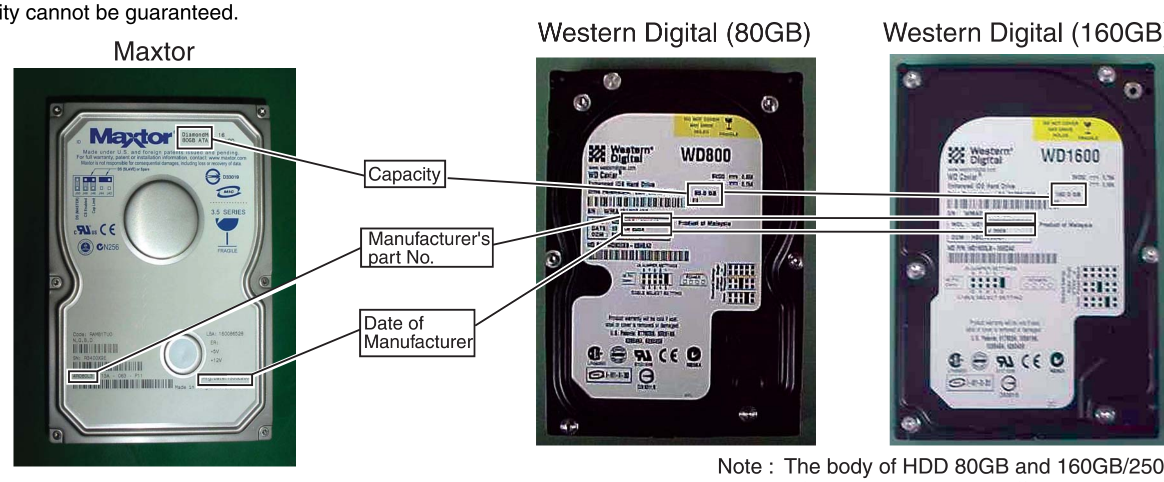
- When returning a defective HDD for analysis, handle with care as if it were a good product. Otherwise, the results of analysis may not be correct.
- When packing, use the antistatic bag and packing materials in which the repair part for service was delivered. Attach a copy of the slip for service or a memo stating symptoms in as much detail as possible.

■ Outline and part No. of the HDDs

*Pioneer's part No. is not stamped.

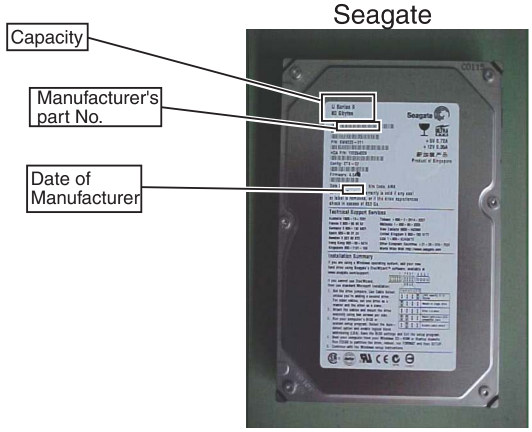
Model Name	Capacity	Maxtor		Western Digital		Seagate	
		Pioneer's Part No. (for service)	Manufacture's Part No.	Pioneer's Part No. (for service)	Manufacture's Part No.	Pioneer's Part No. (for service)	Manufacture's Part No.
DVR-520H-S	80GB	VXF1010	4R080L0-	VXF1043	WD800BB -xxHEAx	VXF1036	ST38001□ACE-
DVR-65H-S	160GB	VXF1028	4R160L0-	VXF1055	WD1600BB -xxFTAx	VXF1040	ST316002□ACE-

- When replacing the HDD, carefully check the capacity and manufacturer's part No. on the part label to avoid replacing with a similar but inappropriate product. You can also check the model No. of the mounted HDD on the Service mode screen.
- Do NOT use repair parts, such as commercially available HDDs, other than those designated above, as their functions, performance or reliability cannot be guaranteed.



Note : The body of HDD 80GB and 160GB/250GB types of Western Digital are different.

Seagate



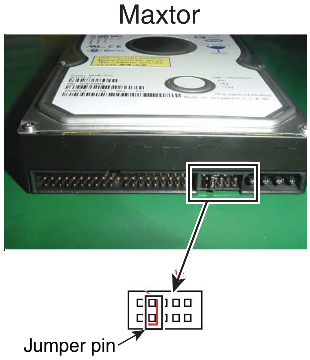
How to read the information of Seagate HDD

Ex. Date Code 0435x
04 year (from July)
manufactured on 35th week

Fig.1 Location of the data on capacity and part No. of the HDD

■ Confirmation of the jumper pin location of the HDD

Maxtor



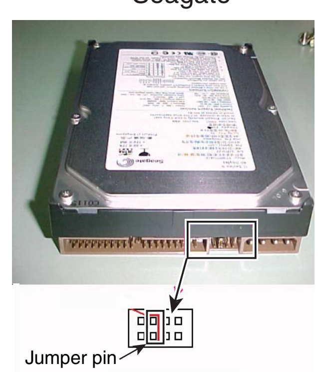
Setting : Cable Select(CS)

Western Digital



Setting : Cable Select(CS)

Seagate



Setting : Cable Select(CS)

7.5 DISC/CONTENT FORMAT

Disc / content format playback compatibility

General disc compatibility

This recorder is compatible with a wide range of disc types (media) and formats. Playable discs will generally feature one of the following logos on the disc and/or disc packaging. Note however that some disc types, such as recordable CD and DVD, may be in an unplayable format—see below for further compatibility information.

DVD-Video DVD-R DVD-RW

Audio CD Video CD CD-R CD-RW

Fujicolor CD

- Also compatible with KODAK Picture CD
- *DVD is a trademark of DVD Format/Logo Licensing Corporation.*
- *is a trademark of Fuji Photo Film Co. Ltd.*

DVD-R/RW compatibility

This recorder will play and record DVD-R/RW discs.

Compatible media:

- DVD-RW Ver. 1.1, Ver. 1.1 / 2x and Ver. 1.2
- DVD-R Ver. 2.0 and Ver. 2.0 / 4x / 8x

Recording formats:

- DVD-R: DVD-Video format (Video mode)
- DVD-RW: Video Recording (VR) format and DVD-Video format (Video mode)

CD-R/RW compatibility

This recorder cannot record CD-R or CD-RW discs.

- Compatible formats: CD-Audio, Video CD, ISO 9660 CD-ROM* containing MP3, WMA or JPEG files
  ** ISO 9660 Level 1 or 2 compliant. CD physical format: Mode1, Mode2 XA Form1. Romeo and Joliet file systems are both compatible with this recorder.*
- Multi-session playback: Yes (except CD-Audio and Video CD)
- Unfinalized disc playback: CD-Audio only

Compressed audio compatibility

- Compatible media: CD-ROM, CD-R, CD-RW
- Compatible formats: MPEG-1 Audio Layer 3 (MP3), Windows Media Audio (WMA)
- Sampling rates: 44.1 or 48kHz
- Bit-rates: Any (128Kbps or higher recommended)
- VBR (variable bit rate) MP3 playback: Yes
- VBR WMA playback: No
- WMA encoder compatibility: Windows Media Codec 8 *(files encoded using Windows Media Codec 9 may be playable but some parts of the specification are not supported; specifically, Pro, Lossless, Voice and VBR)*
- DRM (Digital Rights Management) file playback: No (see also DRM in the *Glossary* on page 97)
- File extensions: .mp3, .wma (these must be used for the recorder to recognize MP3 and WMA files – do not use for other file types)
- File structure: Up to 99 folders / 999 files (if these limits are exceeded, only files and folders up to these limits are playable)

WMA (Windows Media Audio) compatibility

The Windows Media® logo printed on the box indicates that this recorder can playback Windows Media Audio content.

WMA is an acronym for Windows Media Audio and refers to an audio compression technology developed by Microsoft Corporation. WMA content can be encoded by using Windows Media® Player version 7, 7.1, Windows Media® Player for Windows® XP, or Windows Media® Player 9 Series.

Microsoft, Windows Media, and the Windows logo are trademarks, or registered trademarks of Microsoft Corporation in the United States and/or other countries.

JPEG file compatibility

- Compatible formats: Baseline JPEG and EXIF 2.2* still image files
  ** File format used by digital still cameras*
- Sampling ratio: 4:4:4, 4:4:2, 4:2:0
- Horizontal resolution: 160 – 5120 pixels
- Vertical resolution: 120 – 3840 pixels
- Progressive JPEG compatible: No
- File extensions: .jpg, jpeg, jif, jfif (must be used for the recorder to recognize JPEG files – do not use for other file types)
- File structure: The recorder can load up to 99 folders / 999 files at one time *(if there are more files/folders that this on the disc then more can be reloaded)*

PC-created disc compatibility

Discs recorded using a personal computer may not be playable in this unit due to the setting of the application software used to create the disc. In these particular instances, check with the software publisher for more detailed information.

Discs recorded in packet write mode (UDF format) are not compatible with this recorder.

Check the DVD-R/RW or CD-R/RW software disc boxes for additional compatibility information.

7.6 CLEANING

Before shipping out the product, be sure to clean the following positions by using the prescribed cleaning tools:

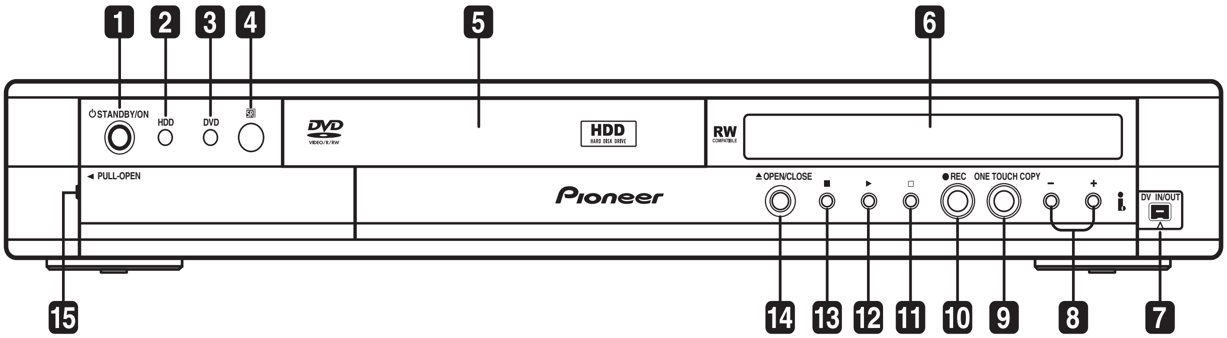
Position to be cleaned	Cleaning tools
Pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

Position to be cleaned	Cleaning tools
Fans	Cleaning paper : GED-008

8. PANEL FACILITIES

8.1 FRONT SECTION

Front panel



1 ⏻ STANDBY/ON
Press to switch the recorder on/into standby.

2 HDD
Press to switch to the hard disk drive (HDD) for recording and playback. The button lights when HDD is selected.

3 DVD
Press to switch to DVD for recording and playback. The button lights when DVD is selected.

4 IR remote sensor

5 Disc tray

6 Front panel display
See *Display* on page 22 for details.

7 DV IN/OUT jack
Digital input/output jack for use with a DV camcorder.

8 +/–
Use to change TV channels, skip chapters/tracks, etc.

9 ONE TOUCH COPY
Press to start One Touch Copy of the currently playing title to DVD or the HDD. See also the *Note on copying* on page 9.

10 ● REC
Press to start recording.

11 □
Press to stop recording.

12 ►
Press to start or restart playback.

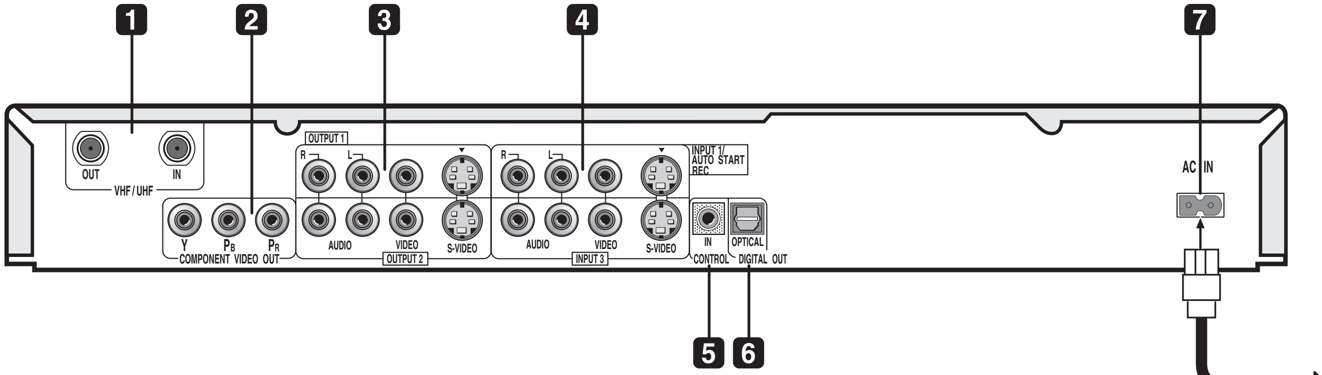
13 ■
Press to stop playback.

14 ⏏ OPEN/CLOSE
Press to open/close the disc tray.

15 Front panel inputs
Pull the cover down where indicated to access the front panel input jacks. Especially convenient for connecting camcorders and other portable equipment.

8.2 REAR PART

Rear panel connections



1 VHF/UHF IN/OUT
Connect your TV antenna to the **VHF/UHF IN** jack. The signal is passed through to the **VHF/UHF OUT** jack for connection to your TV.

2 COMPONENT VIDEO OUT
A high-quality video output for connecting to a TV or monitor with a component video input.

3 Audio/video outputs 1 and 2
Two sets of audio/video outputs (stereo analog audio; S-video and standard (composite) video jack) that you can use to connect TVs or monitors.

4 Audio/video inputs 1 and 3
Two sets of audio/video inputs (stereo analog audio; S-video and standard (composite) video jack) that you can use to connect to satellite receivers, TVs, VCR or other source component for recording.

5 CONTROL IN
Use to control this recorder from the remote sensor of another Pioneer component with a **CONTROL OUT** terminal and bearing the Pioneer SR mark. Connect the **CONTROL OUT** of the other component to the **CONTROL IN** of this recorder using a mini-plug cord.

6 OPTICAL DIGITAL OUT
A digital audio output for connecting to an AV amp/ receiver, Dolby Digital/DTS decoder or other equipment with optical digital input.

7 AC IN
Connect to a power outlet using the supplied power cable after making all other connections.

Front panel connections

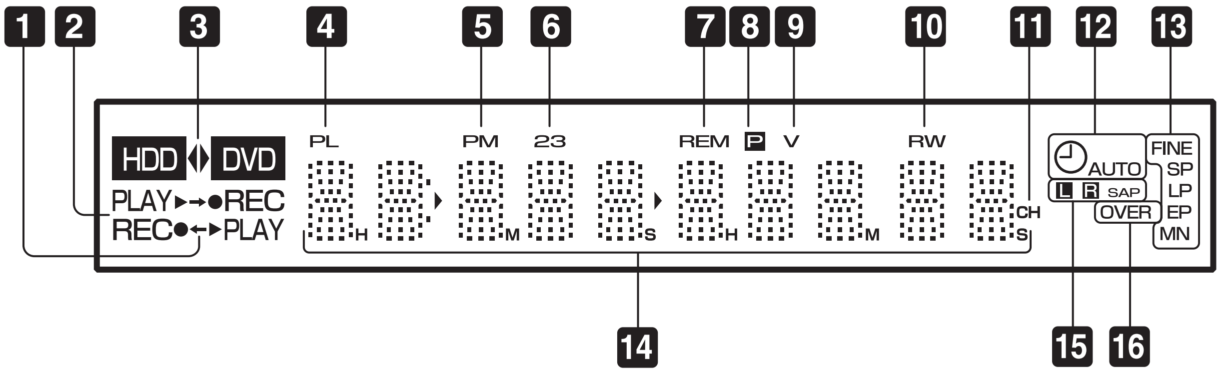


On the left side of the front panel a flip-down cover hides a second audio/video input, consisting of an S-video and standard (composite) video jack, and stereo analog audio jacks.

On the right side is the DV input/output i.LINK connector. This is for connection to a DV camcorder.

8.3 DISPLAY

Display



1 ← / →
Arrows indicate the copy direction between the HDD (HDD) and DVD (DVD).

2 ► PLAY/ ● REC indicators
Lights during playback / recording; blinks when playback / recording is paused.

3 HDD ◄ ► DVD
The '◄' and '►' indicators light to indicate that the HDD or DVD is selected for recording/playback.

4 PL
Lights when a VR mode disc is loaded and the recorder is in Play List mode.

5 PM
Lights to indicate PM (after midday) for the clock display.

6 2 3
Shows the remote control mode (if nothing is displayed, the remote control mode is 1).

7 REM
Lights when the character display is showing the remaining available recording time.

8 P
Lights when the component video output is set to progressive scan.

9 V
Lights when an unfinalized Video mode disc is loaded.

10 R / RW
Indicates the type of recordable DVD loaded: DVD-R or DVD-RW.

11 CH
Channel indicator for the built-in TV tuner.

12 ⏲
Lights when a timer recording has been set.
(Indicator blinks if the timer has been set to DVD but there isnít a recordable disc loaded, or the timer has been set to HDD but the HDD is not recordable)

AUTO
Lights when Auto Start Recording has been set, and during Auto Start Recording.

13 Recording quality indicators

FINE
Lights when the recording mode is set to **FINE** (best quality).

SP
Lights when the recording mode is set to **SP** (standard play).

LP
Lights when the recording mode is set to **LP** (long play).

EP
Lights when the recording mode is set to **EP** (extended play).

MN
Lights when the recording mode is set to **MN** (manual recording level) mode.

14 Character display

15 Channel recording indicators

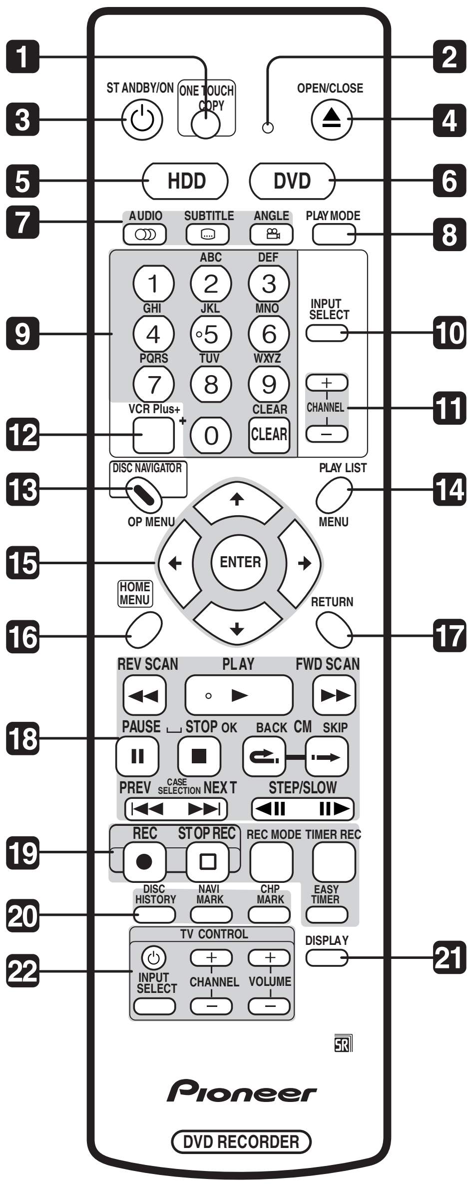
L R
Indicates which channels are recorded when Dual Mono is selected.

SAP
Lights when the currently selected TV channel has a Second Audio Program channel.

16 OVER
Lights when the analog audio input level is too high.

8.4 REMOTE CONTROL

Remote control



1 ONE TOUCH COPY
Press to start One Touch Copy of the currently playing title to DVD or the HDD.

2 Remote control indicator
Lights when setting up the remote control for use with a TV and when setting the remote control mode

3 ⏻ STANDBY/ON
Press to switch the recorder on/into standby.

4 ⏏ OPEN/CLOSE
Press to open/close the disc tray.

5 HDD
Press to select the hard disk (HDD) for recording or playback.

6 DVD
Press to select the DVD for recording or playback.

7 DVD playback functions

AUDIO
Changes the audio language or channel. (When the recorder is stopped, press to change the tuner audio.)

SUBTITLE
Displays/changes the subtitles included in multilingual DVD-Video discs.

ANGLE
Switches camera angles on discs with multi-angle scenes.

8 PLAY MODE
Press to display the Play Mode menu (for features such as search, repeat and program play).

9 Alphanumeric buttons and CLEAR
Use the number buttons for track/chapter/title selection; channel selection, and so on. The same buttons can also be used to enter names for titles, discs and so on.
Use **CLEAR** to clear an entry and start again.

10 INPUT SELECT
Press to change the input to use for recording.

11 CHANNEL +/–
Press to change the channel of the built-in TV tuner.

12 VCR Plus+
Press, then use the number buttons to enter a PlusCode® programming number for timer recording.

13 DISC NAVIGATOR / TOP MENU
Press to display the Disc Navigator screen, or the top menu if a DVD-Video disc is loaded.

14 PLAY LIST / MENU
Press to switch between Original and Play List content on VR mode discs, or display the disc menu if a DVD-Video disc is loaded.

15 ↑/↓/←/→ (cursor buttons)and ENTER
Used to navigate all on-screen displays. Press **ENTER** to select the currently highlighted option.

16 HOME MENU
Press to display the Home Menu, from which you can navigate all the functions of the recorder.

17 RETURN
Press to go back one level in the on-screen menu or display.

18 Playback controls

◀◀ REV SCAN / FWD SCAN ▶▶
Press to start reverse or forward scanning. Press again to change the speed.

▶ PLAY
Press to start playback.

❚❚ PAUSE
Press to pause playback or recording.

■ STOP
Press to stop playback.

CM SKIP(commercial skip)
Press repeatedly to skip progressively forward on the disc.

⏮ PREV / NEXT ⏭
Press to skip to the previous or next title/chapter/track/folder; or to display the previous or next menu page.

◀II STEP/SLOW II▶
During playback, press to start slow-motion playback; while paused, press to show the previous or next video frame.

19 Recording controls

● REC
Press to start recording. Press repeatedly to set the recording time in blocks of 30 mins.

□ STOP REC
Press to stop recording.

REC MODE
Press repeatedly to change the recording mode (picture quality).

TIMER REC
Press to set a timer recording from the standard Timer Recording screen.

EASY TIMER
Press to set a timer recording from the Easy Timer Recording screen.

20 DISC HISTORY
Press to display summary information (disc name, recording time left, etc.) from the last 30 recordable discs loaded.

NAVI MARK
Press to select a thumbnail picture for the current title for use in the Disc Navigator screen.

CHP MARK
Press to insert a chapter marker when playing/recording a VR mode DVD-RW disc.

21 DISPLAY
Displays/changes the on-screen information displays.

22 TV CONTROL
After setting up, use these controls to control your TV.

A

B

C

D

E

F

■ Jigs list

Name	Jig No.	Remarks
Service Remote Control Unit	GGF1381	adjustment, diagnosis
DVD Test Disc (DVD-Video)	GGV1025	Check of DVD-Video
DVD Recorder Data Disc	GGV1179 (*)	diagnosis (ID data setting)
Flexible Cable (40P)	GGD1370	diagnosis of Drive Assy

(*) : GGV1134 is now released, however GGV1179 will be released in JUNE/2004.
Until GGV1179 is released, use GGV1134 data disc.